

QUIET HOURS
WITH NATURE



Mrs. Brightwen

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Uncle Edward and Aunt Hester,
from F. Martelli, Christmas 1905.



QUIET HOURS
WITH NATURE

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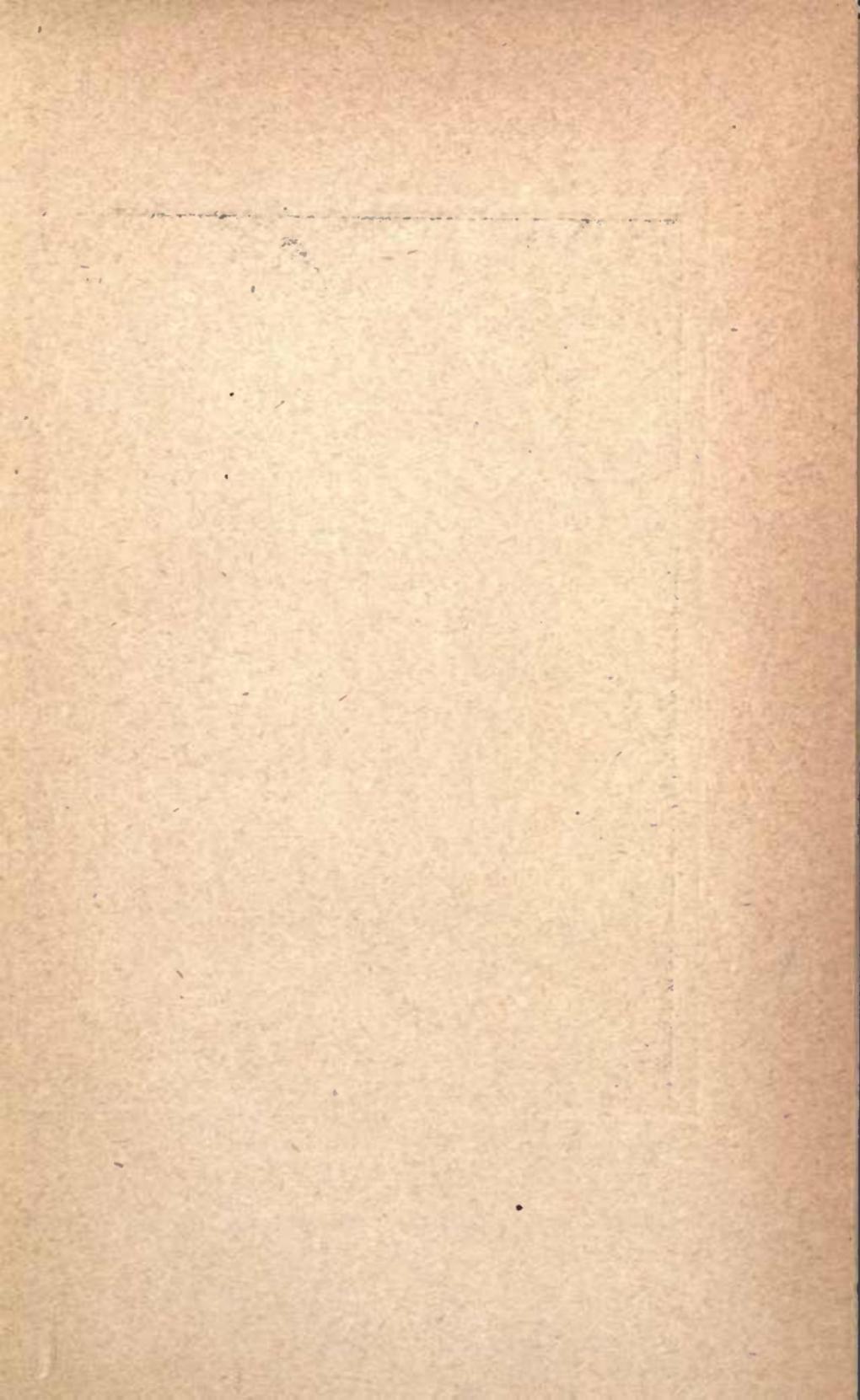
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VIEW AT THE GROVE.

QUIET HOURS WITH NATURE

BY

MRS. BRIGHTWEN, F.Z.S., F.E.S.

Vice-President of the Selborne Society.

ILLUSTRATED BY THEO. CARRERAS



"Here all is quiet, but for faint sounds made
By the wood creatures wild and unafraid."

W. MORRIS, *The Earthly Paradise.*

LONDON : T. FISHER UNWIN
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TO

MY DEAR NEPHEW

EDMUND GOSSE

I AFFECTIONATELY DEDICATE

THIS BOOK.

2090973

*** The greater portion of this work has appeared
in serial form in *The Girls' Own Paper*.



Preface

TO the kind and indulgent circle of readers which has now for thirteen years gathered round me, I offer once more some of the results of my study of such natural objects as happen to come under my notice in my quiet home.

Precluded as I am, by the measure of my health and strength, from travelling widely and from visiting fresh scenes, I am yet indisposed to regret my limitation. It is to this, perhaps, that I owe the ceaseless enjoyment which I gain from being obliged to look to my own surroundings for those sources of interest in animal, bird, and insect life, which an English country is ready to supply, in an inexhaustible degree, to the patient and willing observer.

Trees, too, have ever been to me almost as well beloved as moving creatures. So much have I been impressed by the mystery of "those green-robed senators of mighty woods," that I have often longed to devote an entire volume to their forms and their development. But this is a task which I am fain to leave to abler hands than mine. The

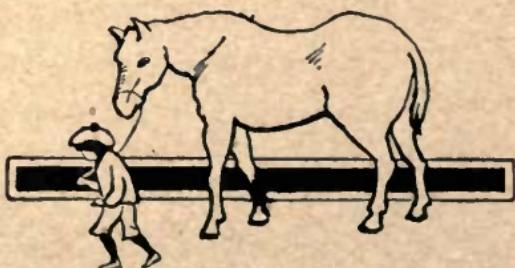
studies of trees contained in this volume must be regarded simply as monograph-portraits of certain individuals which possess, either from age or size, some special interest for me, and I would hope for my readers also.

I am often amazed to find how little people in general know or care about the life-history of our lovely English trees. The mere fact that they produce flowers comes as a surprise to many, and it is rare to find persons who can tell the Latin and English names and the varied uses of even our commonest foliage trees.

My wish to create an interest in this study needs, I believe, no excuse. Even in the smallest garden there are problems for the observant eye for which the greatest minds cannot furnish an answer. We need not therefore go far to find subjects for thought and reflection. I truly believe that those have the fullest enjoyment of life who are ready, with open mind, to receive Nature's teachings. It is in the hope that they may tend to stimulate such studies I send forth these chapters which relate my own experiences in the observation of animal, bird, and insect life.

ELIZA BRIGHTWEN.

March, 1904.



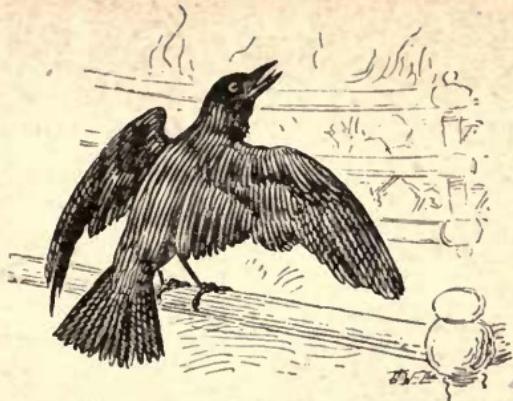


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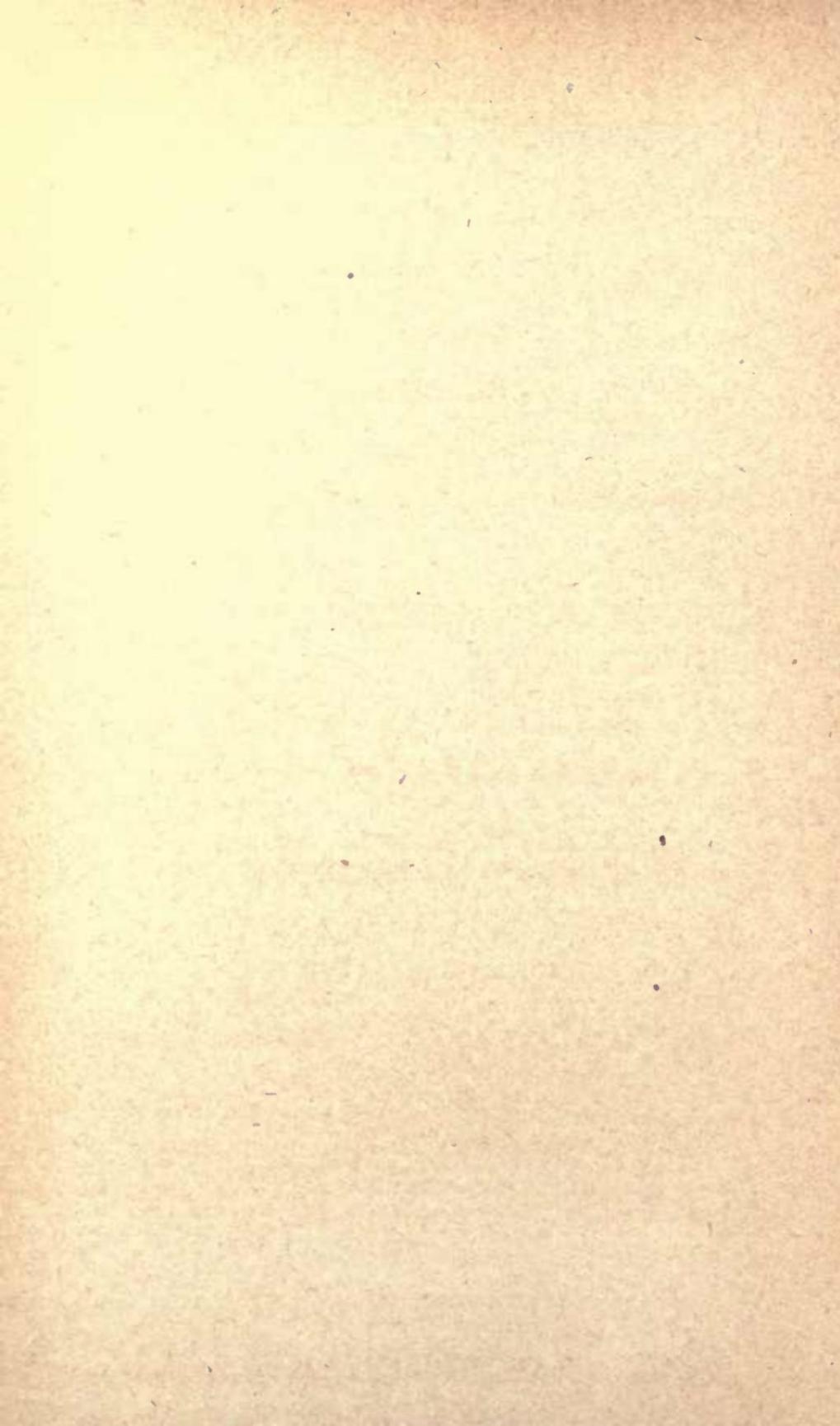
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BEASTS, BIRDS, AND A BEETLE



THE FIERCENESS OF GLOUCESTER

A STUDY IN THE TAMING OF SQUIRRELS

If any one wishes for a fund of never-failing amusement, let her cultivate and tame wild squirrels!

It takes some years of patient feeding and coaxing, but when the confidence of the graceful little animals has once been won, they reward their friends with never-ceasing antics and gambols, fierce little scrimmages and fights amongst themselves, and with a succession of such charming attitudes that one longs for them to sit still quietly enough to allow one to sketch them.

Very frequently I am visited at breakfast-time by as many as nine or ten of these active little rodents. They well know it is feeding-time for them, so they congregate outside the window waiting most impatiently until it is opened, then

they are rewarded by a shower of nuts. Soon there are ten little furry people thoroughly happy, each flinging his nut-shells about with saucy *abandon*, and keeping his black beady eyes fixed on his neighbours lest they should be meditating a sudden aggressive assault if opportunity occurs.

All this is charming, but the real amusement begins when the store of outside nuts is exhausted and the squirrels come trooping into the room to see what they can find there. They spring upon a table, where my doves Peace and Patience reside in their large cage, and scout around to find more food.

Several of the squirrels are tame enough to take the nuts out of our hands, others boldly run off to the cupboard where their food is stored, and they have taught themselves to leap, first up to a shelf, and then into a box, where we soon hear the little marauders cracking the nuts.

But how shall I describe the amusing squabbles that go on?

One, seated on the window-ledge, is knocked over by another leaping in; both reach the ground together and have a tussle, squeaking and grunting the while; others join in the fray, then there is a race round the room ending with a dissolving view of squirrels' tails disappearing out at the

window. It is all play, for no real harm is done, it is only the effervescence of high spirits and keen appetite.

Some years ago a tame squirrel was sent to me from Gloucester to be let loose in the garden. For some time we could not feel sure of her identity; she mingled with the others and did not show any special tameness.

Of late, however, "Gloucester," as we have named her, has become a very marked character. Tameness has merged into a more and more defiant aggressiveness, not altogether to be desired. Whilst I am peacefully writing my letters, Gloucester springs suddenly upon my table, walks over my note-paper, regardless of the smudges her tail leaves behind her, leaps on to my shoulder, and with an angry growl the small tyrant intimates that nuts must be forthcoming instantly or else she will make her claws and teeth felt in a way that I shall remember. At present I meekly obey, for peace sake, but I only hope that the time may never come when "Gloucester" will have to repent of her effrontery and find her liberty curtailed.

When an animal or bird has been reared from its early years with care and kindness it is remarkable how invariably all its faculties are developed

and brought out. The native instincts remain, but being cultivated, they result in many curious traits showing unusual intelligence.

Gloucester having been petted from her baby-hood is just an instance of educated ability. I must pay a tribute to her skill and perseverance by relating what I saw her achieve in my dining-room when she thought no one was observing her. The heavy oak door of the nut-cupboard was closed but not latched ; Gloucester wanted to get some nuts, and when she found that she could not get at them, she sprang up to the handle, and sitting upon it, she pushed with all her might against the door-post and actually made the door open sufficiently for her lithe little body to squeeze through into the cupboard. It certainly showed a measure of reasoning power, thus to carry out several varied actions in order to attain a desired end.

I do forgive the terrible virago a good deal because of her cleverness, but when she sits loudly cracking nuts on the table-cloth within three inches of my plate at breakfast-time, and yet will not allow me to take up my fork or spoon without a growl or a snap, and when I know how severely she bit a gentle little girl who merely wished to "stroke the pretty squirrel," I think my readers

will agree that Gloucester carries the emancipation of the female sex to a very serious length.

Squirrels vary a good deal in their appearance according to the season of the year. They are in their fullest beauty in April and May when the fur is thick and of a rich red brown, the ears are adorned with long additional hairs called pencils, and the tails are thick and bushy. Now, in the month of June, having worked industriously making their nests (*dreys*) and having families of young squirrels to maintain, the little parents' fury coats show signs of wear and tear ; the ear-pencils have fallen off, and all the tails have become cream colour, which gives them rather a bizarre effect as they flit rapidly across the lawn.

We often see the squirrels busily stripping off the inner fibre of the lime-tree branches, of which soft material they form their dreys. The fibre is held together by small interlacing twigs of larch, and the nest is usually placed in the fork of a branch very high up in some fir-tree where the foliage is thick enough to afford perfect concealment. Sometimes a hole in a tree-stem is chosen, but wherever it is, the future home is carefully lined with moss, leaves and fibres, and is a cosy retreat for the baby squirrels.

I often wish we could see the little ones when

quite small, but they never appear at the window until they are nearly as large as their parents. Nor do I quite look forward to the day when Gloucester will present to me a whole family of young persons as insolent and bullying as herself.

MY EGYPTIAN JERBOAS

(*Dipus jaculus.*)

FOR some years past I have kept a pair of these amusing little animals in my conservatory. They inhabit a large case with glass sides and top, the floor being thickly covered with dry sand, in which they delight, as twilight comes on, to play and frolic with each other. After a light supper of seed and lettuce the jerboas commence their nightly exercises, which seem to afford them a never-ending source of delight.

As their nostrils are so curiously formed that they can be entirely closed against the entrance of sand, the little animals are able to make it their plaything, and are for ever pushing it with their muzzles up and up until they have formed a heap and shaped it to their mind. Then they begin again and raise another hillock. No matter if their seed pan happens to be in the way ; it is

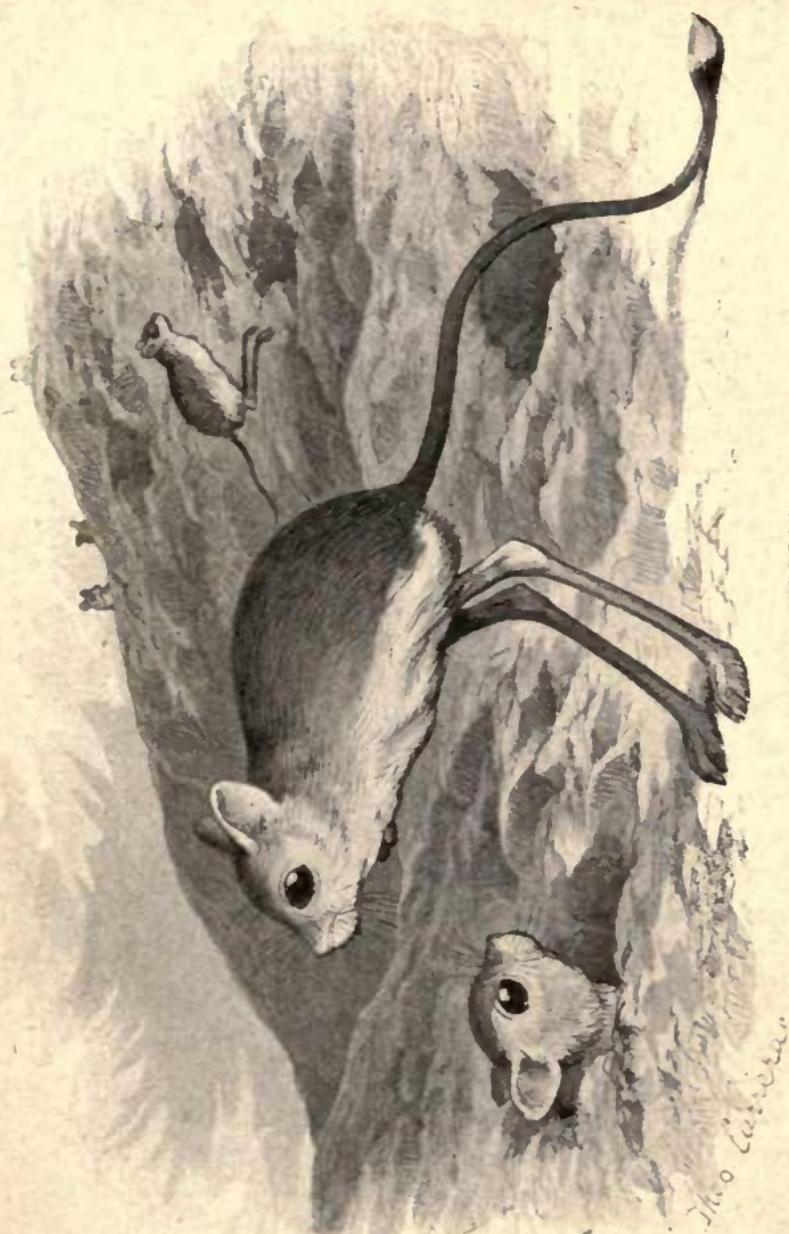
heaved up, and over it goes ; a little later probably their saucer of water shares the same fate. I have now learnt the wisdom of giving them seed and water in heavy pans that cannot be upset.

Of course, next morning I find the miniature desert a series of hills and valleys, and the weary little toilers are by that time fast asleep, clasping each other in their soft bed of wool.

The drawing will show my readers the curious formation which enables this desert-dweller to play so many extraordinary pranks. Its long hind legs help it to leap with marvellous speed along the surface of the ground.

In motion the tail is held straight, but when the animal is quiet the tail curves and acts as a third leg to support the body. The very small forelegs are kept so near the chest that they are only visible when extended to grasp a seed or nut to be nibbled by the sharp incisor teeth.

The softly furred tail, with its pretty black and white tip, is an object of great solicitude to the jerboa ; it is passed between the forelegs and carefully licked. Every hair is smoothed more than once during the evening toilet, which not only includes a general licking of the fur all over the body, but ends by an amusing acrobatic feat which seems to express an *abandon* of ease and



EGYPTIAN JERBOAS.

Meriones libycus

happiness such as I have observed in no other animal.

The jerboa lies down flat upon the sand and stretches out its amazingly long legs to their fullest extent, then instantly draws them up as if by an invisible string, again extends them and then rolls over and over, finally springing up ready for any amount of exercise and frolic.

The jerboa affords a remarkable instance of protective colouration. The soft fawn colour of its fur is so exactly in harmony with the desert sand that travellers say it is almost impossible to discern the little creatures as they flit over the ground, looking more like a flight of birds than animals.

I can confirm the report of their swiftness, for in an evil moment I let my pair loose in the drawing-room, where they instantly showed their agility by leaping and bounding from one end of the room to the other in a high state of excitement and happiness. I enjoyed watching their gymnastics, but my spirit sank within me when I began to consider in what possible way I could capture them again. They would allow me almost to touch them, and then off they would dart in a wild, noiseless race, threading their way through the furniture, enjoying such a game of hide-and-seek as they had not known since they left their native desert.

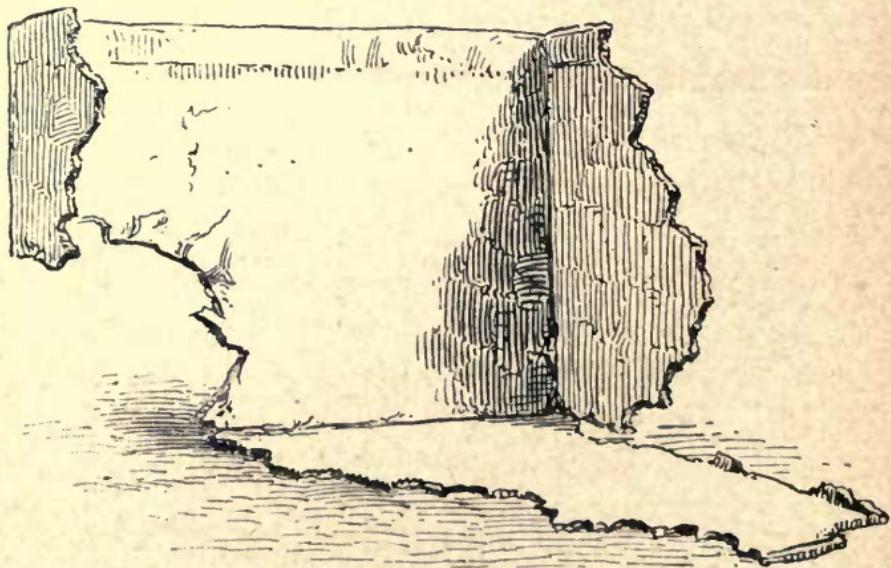
As it was absolutely needful that they should be caught, I had to resort to a butterfly-net, and by skilful strategy I was at last able to secure the lively creatures and restore them to their home, where, I may remark, they have abundant room for a reasonable amount of "healthful play."

Naturalists are somewhat puzzled to know how jerboas can support life upon the scanty vegetation which is all the desert supplies them with.

I have tried to tempt my small pets with every kind of dainty, but nothing will they accept but sunflower and canary seeds, lettuce and dandelion. On these they flourish and are always fat and sleek. One rather amusing difficulty has risen from the settled determination of the jerboas to gnaw up their house and home! I thought a tin box might be rather unsuitably cold for them to sleep in, so I provided a wooden one, well filled with soft wool and with an entrance hole at one side. This appeared to be the right thing, but evidently it was more valuable to the jerboas as affording exercise for their busy little teeth than even as a dwelling-house. One side of the box was soon whittled away to sawdust, then the roof disappeared, and I have had the ruins drawn to show all that remained of the box after a few weeks of their diligent carpenter's work. They

are now inhabiting their fourth wooden home, and it is fast disappearing.

Those who have traversed the arid deserts of Egypt and Arabia describe these little animals as living gregariously in warrens like rabbits, forming the burrows in the hard stony soil. As each little



"THE RUINED HOME."

tunnel has four entrances, the ground in many places is perfectly honeycombed with small holes, in and out of which the jerboas, young and old, are for ever noiselessly flitting, as they are extremely timid, and retreat at the slightest sound.

They appear to be amiable creatures, not only

helping each other in the excavation of their underground dwellings but sharing their homes with the sand-grouse, desert lark and various lizards.

My specimens not having been obtained when young, I can never hope fully to tame them. They will submit to be stroked and will take lettuce from my hand, but they have a very affronting way of flicking sand towards their visitor, as a gentle hint that they disapprove of any company but their own. In spite of this trifling want of courtesy my jerboas are very fascinating. They never attempt to bite, they are perfectly clean and odourless, and if a still larger space could be given them, I feel sure that their wonderful agility and fantastic movements would make them still more attractive.

THE TREE-KITTENS

AT the close of a sultry day in summer I strolled out into my garden to enjoy a ramble in some shady paths. As I was passing a lime-tree whose trunk was surrounded by a perfect thicket of stems and interlacing branches, I heard a plaintive sort of cry which appeared to issue from the depths of the greenery around the tree. Stopping to listen, I heard the sound renewed again and again, and supposing it might be a bird in distress, some fledgling needing help, I called and chirped to encourage the "thing," whatever it might be, to show itself, so that I could render the assistance for which it was appealing.

The cry came from a perfectly dark mass of twigs and branches about eight feet from the ground, so that I could neither see nor capture the creature that had hidden itself there. At length I felt sure the sound must be the cry of a kitten. I

therefore began mewing like a mother-cat and, encouraged by that welcome sound, I could dimly discern a little furry creature feeling its way down through the branches.

With the help of a stool I reached up and grasped what proved to be a most impish-looking animal with jet black head, body, legs, and tail, but light grey-coloured along the back.

It was very thin, and mewed piteously, looking up with its pretty blue eyes as if to let me know it was an orphan and needed my pity and protection.

I now heard other voices proceeding from the tree, and, being unable to reach high enough, I sought help to rescue the remainder of the family.

Finally, four of these curious kittens were brought to light, all exactly alike, and I should suppose about three weeks old.

They were placed on the lawn, and a council of friends decided that, as parentless waifs, they had a strong claim upon our sympathy, and ought to be adopted. The next step was to obtain some milk, but how to induce the kittens to drink it was a problem not easily solved. As they had no idea of lapping, warm milk had to be given by means of a baby's feeding-bottle.

This process over, they were placed in a hen-coop under a deodar on the lawn, and they

soon nestled down contentedly in a warm bed of hay and wool. In the evening they were brought into the conservatory lest a stray rat or weasel might attack them in the night, which would have resulted in a tragical ending for our defenceless little kits. After a few weeks the gambols of our tree-kittens (as we always called them) were a great amusement to us ; they frolicked amongst the fir-tree branches, ran races in and out, and up the stem of the tree for some considerable height, had mimic battles and wrestling matches, and as in every attitude they showed the exquisite gracefulness of the cat tribe, one could not help watching such happy little athletes.

It was rather curious that they seemed quite to understand that their domain was beneath the deodar, for they seldom strayed far from it unless to creep stealthily, towards evening, across the lawn to visit us in the drawing-room.

We became accustomed to see and hear a purring black imp trying to ingratiate itself with us, putting on its best manners and most coaxing ways in the hope of being taken up into a lap and petted, and very frequently these wiles succeeded, for the kittens were most fascinating little creatures, always happy, and good-tempered, and ready for play.

My mongoose was a great puzzle to the small cats ; they approached him cautiously, and I had to keep guard lest he might give them a fatal bite. What was my surprise, however, to find that he not only tolerated their advances, but allowed one kitten, bolder than the rest, to go suddenly up to him and in the rudest manner to give him a box on the ear ! This so utterly astonished Mungo that ever after he affected entire indifference, as if such ill-bred creatures were beneath his notice.

As time went on I found it very difficult to get my small charges to come in at night ; they disappeared each evening and would make no response to my call, so I let them have their own way and left them out. Next morning I always found them purring cheerfully in the sunshine, rolling over and over in happy frolics on the lawn.

I managed to find out that their nightly retreat was a cosy recess in the thick branches of a tree—about three feet from the ground, where they were effectually hidden as well as sheltered from rain and wind. A remembrance of their birthplace seemed to suggest this as a much more pleasant home than the one I had given them in the conservatory. Like all young creatures they would grow from kittenhood into cats, and the sorrowful

thing was that, with all my various pets indoors and out, cats could not be tolerated, so in course of time my little waifs were all given away, each transplanted into a good home where it would be a household pet, and so my tree-kittens are now only a memory of the past.

IN MEMORY OF MUNGO

THE life of my little wayward, amusing, lovable Mungo, the Ichneumon, has come to an end, and it surprises me to discover what a blank is left in mine. For five years the mongoose has been part of our household, constantly in sight, basking in the sun on a wool mat in summer, or on the rug before a blazing fire in winter. However sound asleep the little animal might appear to be, he was always furtively on the watch for a disengaged lap, and would come and meekly sit up on end like a spaniel entreating to be taken up and nursed. If he failed in this project, then he would secretly creep under a dress skirt and lie there *perdu*, so that when she rose, the owner of the skirt would be startled to find his solid body hindering her progress. This habit was a very dangerous one, and had we not trained ourselves to rise cautiously, my friends and I could hardly have avoided often treading upon the little creature.

For the last six months Mungo has evinced a strong desire to live in a rabbit hole in the centre of a great clump of rhododendrons, and as I thought "camping out" might be good for him, his meals were placed within his reach, and he was allowed, as ever, to have his own way. One day, however, I found out that he swallowed his food with difficulty, and a close examination led to the discovery of a tumour in his throat, which must eventually have closed it up and caused a lingering death. The going away from us all was now accounted for, and I sorrowfully recognised the presence of that instinct which leads animals and birds to steal away to some quiet corner when they know that they are going to die.

There was no hope that an operation for the removal of the tumour could be of any use, since Mungo would have proved a hopelessly intractable patient. All I could do, therefore, was to coax him to come indoors again and watch over his meals with extra care, that his food might be of a kind that he could swallow without difficulty. Thus the little animal lived on for a month or two without apparent pain, until at last he could no longer swallow, and I knew it would be kinder to end his life instantly than to allow him to die

slowly of starvation. Those who have known the pang of losing some favourite animal, which may have been for years a cherished companion, will have some compassion for me in parting with Mungo. I could hardly nerve myself to give the fatal order, and I resolved that at any rate before doing so I would try and secure a life-like portrait of the pathetic little face of my much-loved pet. In this I happily succeeded.

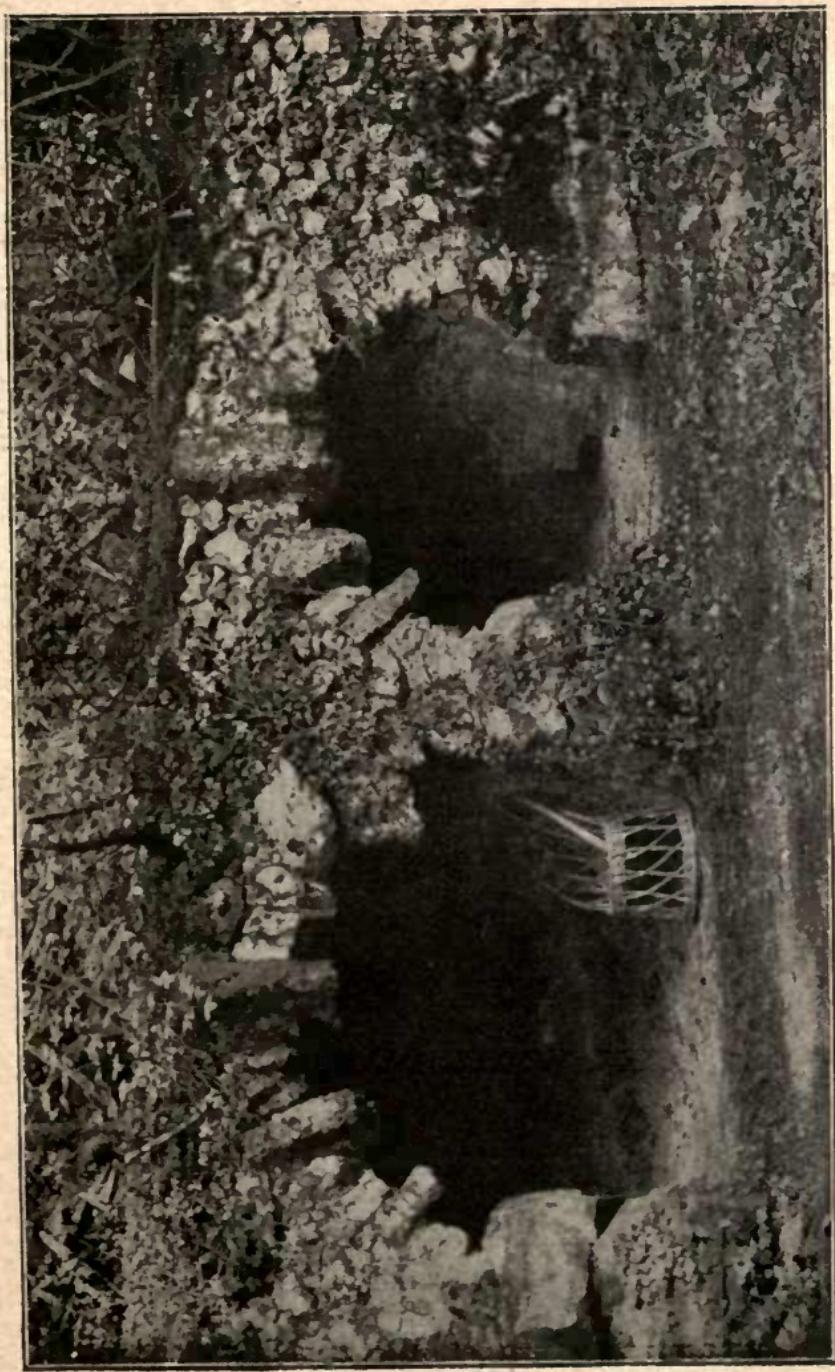
I never possessed an animal that from first to last gave me such an amount of worry, vexation, and perplexity, and yet, even as a mother generally cares most for her naughtiest child, so Mungo's perversity seemed only to endear him to us all. The mongoose never could be made to understand, as a dog or cat would, that he had done wrong and ought to be ashamed of himself. He would pull over a choice vase of flowers, and, standing amid the ruins of the china, would look up with the most innocent expression imaginable; one could not be angry with such an irresponsible creature. I am glad now to remember that all Mungo's wicked little ways were patiently endured. If he had any crumpled rose-leaves in his life they were of his own making, and I like to think that at any rate I did my best to smooth them for him.

TAME VOLES

ONE day last August, when strolling in a secluded part of my garden, I was surprised to see some little brown mice playing about and racing after each other without at all regarding my presence.

I stood and watched these playful gambols, and soon discovered that the little animals were short-tailed field-mice, or voles, as I believe they ought to be called. Some differences in structure separate the voles from the true mice and rats; they also differ in their food, the voles being almost entirely vegetable feeders.

The water-rat, so called, is a vole and a perfectly harmless little animal. I often endeavour to explain this fact to farmers and working-men, who seem to think they have done something meritorious when they have hunted to death one of these voles, whose harmless diet consists chiefly



THE VOLES' RETREAT.

of duckweed, flag, rushes, and other water-plants ; but, unfortunately, it looks like a land rat, and so it has to suffer for the evil reputation of its relative.

There are two small voles, the red field-vole and this commoner short-tailed species which inhabits my garden.

I had often wished to catch and keep these little animals as pets for purposes of study ; and, finding some specimens already so tame, I began to entice them to come to a special place under a stone archway by daily strewing at exactly the same spot some oatmeal and canary seed.

Very soon the tiny creatures would allow me to stand and watch them feeding, and I drew nearer and nearer until I could almost touch them.

I then put a mouse-cage under the arch in the hope that they might accept it as a home and thus be led into voluntary captivity. This new idea met with a measure of approval, for one little vole scooped out a small cavity beneath the cage and appeared to make itself quite at home there, even allowing me to lift up the cage without moving, gazing curiously at me with its small black eyes.

This went on from August until October. The

voles and I grew to be quite good friends ; but, as the colder weather would soon be hindering my daily visits, our friendship would have to cease unless I could bring my small pets indoors.

It struck me that they might be coaxed into captivity by another device. I placed a glass globe under the arch, containing their favourite food, and a piece of wood leaning against the globe to enable the mice to climb up and leap in.

When I went next morning there was a little vole inside the globe, and by no means frightened, for it allowed me to stroke its soft fur without alarm.

I have had great pleasure in watching the graceful attitudes of this small creature. It sits up like a squirrel holding a grain of wheat in its paws ; then, its meal over, it thoroughly cleans its fur, brushes its whiskers, and performs a careful toilet before going to sleep, curled up in a lump of cotton wool and moss.

My ultimate aim being to obtain some baby voles to be trained into absolute tameness, I set to work to secure a mate, and placed the globe as before, baited with tempting food.

In a few days' time I caught a second vole, and now Darby and Joan live happily together

in a square glass case where they have room for exercise and where I can see and record their doings.

All this may seem to some readers exceedingly trivial and not worth writing about ; but, seeing that we cannot be all day out-of-doors making observations about these and other subjects of study, there seems some use in keeping creatures in happy captivity, because one can thus become ultimately acquainted with them, and learn many facts about their life and habits which would otherwise be difficult or impossible to observe.

I am now testing their liking for various plants, and after a time I may be able to make a list of the weeds they consume, which may possibly be a set-off to the damage they do in other directions.

Voles have an acute sense of smell, as I learn in this way. The little pair may be sound asleep in their bed of moss and wool, but I no sooner place an earthy root of groundsel or chickweed in their glass case than I see an inquisitive nose at the entrance of the dormitory sniffing the air, and in another minute out comes mousie to enjoy the feast of fresh greenery.

The winter passed by uneventfully, until on the morning of January 26th I heard quite loud



DARBY AND JOAN.

growls and squeaks proceeding from the voles' residence.

The cotton-wool quivered and was upheaved by unseen forces. Something serious must evidently be going on, so I cautiously interfered.

In uplifting the woollen mass I disturbed four little sprawling infants of a bright pink colour and no particular shape! They were, of course



VOLE, THREE DAYS OLD.

speedily replaced, and I could well understand the state of affairs.

The father mouse must be removed somehow as he was evidently in the way and quite upsetting the nursery arrangements, but how I was to tell which was which was a real puzzle.

I thought I would try to learn a lesson from the wise king of old and see whether maternal love would not prove a sure test. I thought I would allow the vole that first returned to the nest to remain, and place the other in a separate globe.

The plan was successful, for the mother mouse went back to the nest at once and set to work to repair the dwelling which I had somewhat disarranged.

The young voles were by no means beautiful. Bright red in colour, the thin hairless, almost transparent, skin allowed one to see the beating of the heart and its circulation very plainly.

The head was nearly half the length of the body, and the eyes were, of course, closely shut, yet, feeble though they were, when only two day old the small creatures were full of life, and resented being touched by giving angry little kicks and plunges. Indeed, I never knew any family so forward.

I purposely stroked and handled the four small mites daily so that they might grow up to be perfectly tame from their babyhood. In doing this I noted one or two rather curious traits of instinct.

Whilst still quite blind, the young voles, if placed on a table, would invariably creep backwards and continue a retrograde movement, until at last they would have fallen over the edge of the table if I had allowed them to do so.

I imagine nature teaches this evolution so that in their native burrow, these defenceless weak

young creatures may invariably retreat as far back as possible out of the reach of danger.

About ten days later, whilst I was holding one of the young voles in my hand in order to take its portrait, it surprised me by sitting up and beginning to clean its fur and whiskers as carefully and neatly as if it had been a cat by the fireside, even licking each little paw in succession until its toilet was complete. The creature was



VOLE, THIRTEEN DAYS OLD.

only thirteen days old and still quite blind, so it shows how soon instinct teaches the important lesson of cleanliness.

On the morning of the fourteenth day the little mice could see and became quite enterprising, nibbling lettuce leaves and oatmeal and roaming about their small domain. A little later on they could feed themselves, and I believe I ought then to have taken away the hard-worked

little mother, for I imagine family cares and worries must have accounted for my finding poor Joan had died on the very day when I purposed letting her and her mate have their liberty.

I set Darby free in his old home under the archway, where no doubt he will soon find another mate, and I shall probably discover by their depredations in my garden that he has reared strong and healthy families to prey upon my cherished plants and trees.

At present the young voles are by no means tame, and still indulge in kicking, squeaking, and scratching if I attempt to stroke them, but I have learnt a good deal about their domestic life and derived a great deal of amusement from my experience in vole-rearing.

MEROPS, THE BACHELOR

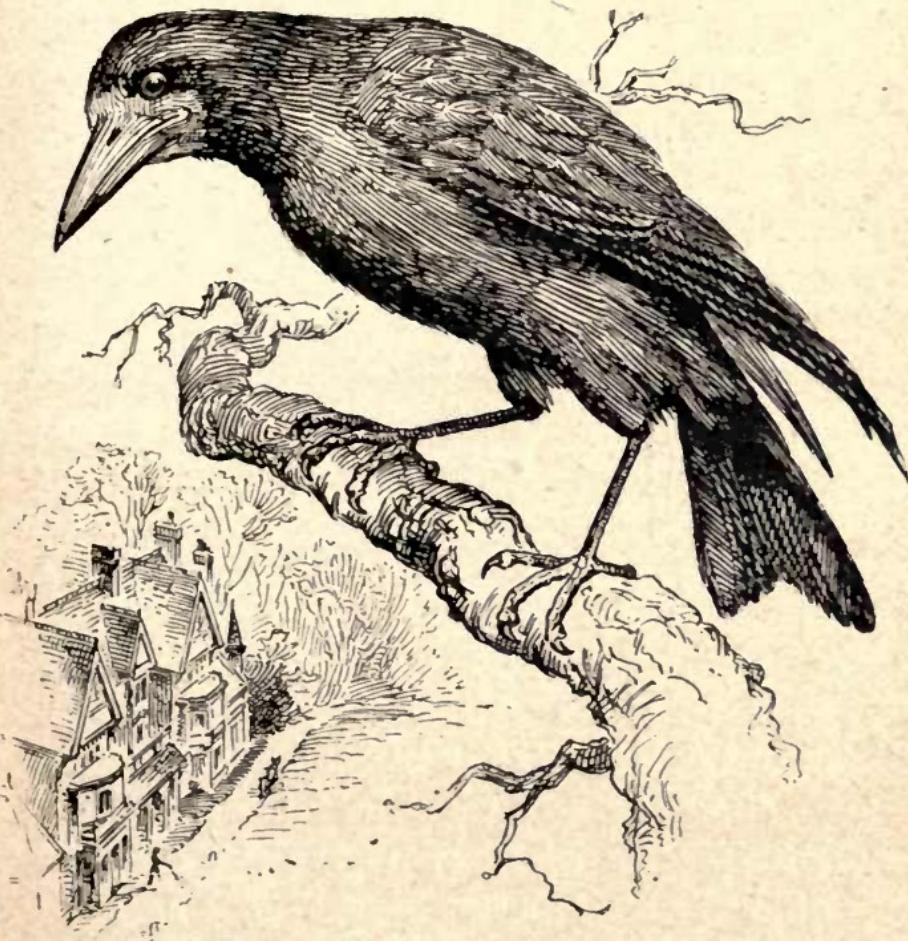
FOR some years past a rather weird-looking solitary rook has elected to give us his company in the garden, instead of living with his kith and kin in the neighbouring wood.

It would be interesting to know what has thus severed him from social life. Has he been crossed in love, or has a rook-parliament for some deep-dyed iniquity passed sentence of banishment upon him? Is he possibly a bird of such a misanthropic turn of mind that a solitary life has really been his deliberate choice?

Be these questions answered as they may, Merops is a sort of familiar spirit haunting our garden. He is not always visible, it is true, but let some tempting food be thrown out, and in a few minutes our domestic vulture is sure to be seen swooping down to snatch a share of the feast.

His tendency to keep ever on the watch with a

view to earthward things led me to give him the name of the unhappy king of Cos, whose wife was



MEROPS, THE BACHELOR.

one of the attendants of Diana, by whom for some neglect of duty she was put to death.

I believe the story goes that Merops, in his

agony of bereavement, desired to commit suicide so as to rejoin his beloved queen in the world of shades, but Diana placed him amongst the stars under the form of an eagle. Even this fate could not prevent his gaze being ever downward, searching vainly for his dearly-loved wife.

I will draw a veil over the difference of motive between the ancient and modern Merops. I fear in the latter case appetite rules alone, but I can give him a good character for personal amiability, for I have never seen him use his great beak aggressively.

During the past winter and spring we have seen - very interesting bird-visitors feeding just outside the window, attracted there by a constant supply of coarse oatmeal and sopped bread.

A gorgeous cock-pheasant in full plumage, with snowy white ring of neck-feathers and crimson ear-patches, leads his little band of five or six hens many times a day to enjoy the food they like so much. Merops joins them, and so does a tribe of smaller birds. Jackdaws pounce down at intervals and carry away some spoil. They are born marauders, and seem as if they cannot enjoy any gift quietly like other birds, but must snatch it away in thievish fashion.

The cock-pheasant clucks the whole time he is

eating, to encourage his mates, who are somewhat timid and ready to run swiftly away at the slightest sound.

In connection with Merops I may mention a thrilling incident in the life of my precious little white-throat, Fairy. At six o'clock one morning he was flying about my room as usual, and in a moment, unperceived by me, he must have slipped out at the open window. When I discovered, after a weary search, that my little bird had escaped, I went outside the house, and there under the window stood Merops. I thought he had a guilty look, and I will confess that I believed he had appropriated Fairy for his breakfast. All day long I cherished evil surmises against that innocent rook. At intervals throughout that unhappy day I searched and called, but no trace could I find of my lost white-throat, and greatly did I reproach myself for the open window; but, as it had been my habit to leave the sash a few inches raised during all the years I had possessed Fairy, it had not occurred to me as a possible danger. It may have been a call-note from some wild white-throat which suggested to Fairy the new idea of spending a day out of doors.

It is needless to say the hours passed sadly with me, and I had lost all hope of recovering my bird

when, at six o'clock in the evening, as I was entering the drawing-room, to my utter surprise there was Fairy hopping on the floor, bright and cheery as ever. With a joyous note he flew on to my hand, and seemed in an ecstasy at seeing me again. It will ever remain a mystery how he found his way home, seeing he had never been at liberty outside the house since the day seven years ago when I picked him up a forlorn little orphan fledgling. How such a mite, lost in a hundred acres of land, escaped all kinds of perils from cats, and such birds as hawks, jackdaws and jays, puzzles me extremely; I only wish he could give an account of his adventures and by what wonderful instinct he found his way home before nightfall.

I humbly apologised to Merops for my groundless suspicions, and gave him a royal feed to commemorate the return of the truant.

The tameness of Merops affords me the opportunity of becoming acquainted with various points in the character of a rook which cannot easily be discovered when the bird is seen some distance off in the fields.

We usually speak of rooks as being black, but in reality the colour of the plumage is a rich violet shading into dark blue upon the head. The

feathers have a wonderful power of reflecting the sun's rays, sending out flashes of light with every movement of the bird in a way I have never observed to the same extent in any other plumage.

I never see the crow near enough to tell whether its feathers shine, but the jackdaw has very little reflective power, and the blackbird is a real sooty black, with scarcely any brightness on the surface.

I suppose the huge bare beak of the rook is exactly suited to field-work, as it probes the ground for grubs and worms, but it is rather amusing to see it used for picking up grains of oatmeal. I think Merops himself feels this is rather a slow business, for he sometimes lays his beak sideways so as to shovel in a good mouthful and thus economise time and labour.

All through the winter months food is strewn under the tulip-tree on the lawn, and the entire rookery may be seen daily visiting their feeding-ground. I like to see the busy, useful birds, and to help to keep them alive in hard times; but faithful old Merops abides with us both summer and winter, and we value his friendship accordingly, although why he bestows it upon us will always remain somewhat of a mystery.

MEROPS MARRIED

OUR tame rook Merops has, at last, wooed and won a mate! All through last summer he afforded us so much amusement that I think my readers may like to hear a little more about his domestic life.

Early in March we noticed that Merops now and then carried away some of his dainties to a retired spot behind a rhododendron bush, where we caught a glimpse of another rook timidly awaiting his arrival. Later on it was quite clear that he was not merely flirting, but paying very decided attention to the shy bird who, although she could not be persuaded to approach the house, gratefully opened her huge beak and accepted the gifts of her devoted lover.

Thus we came to know that Merops was no longer content to remain a bachelor, and we looked

forward to many an interesting glimpse into the domestic life of our sable friends.

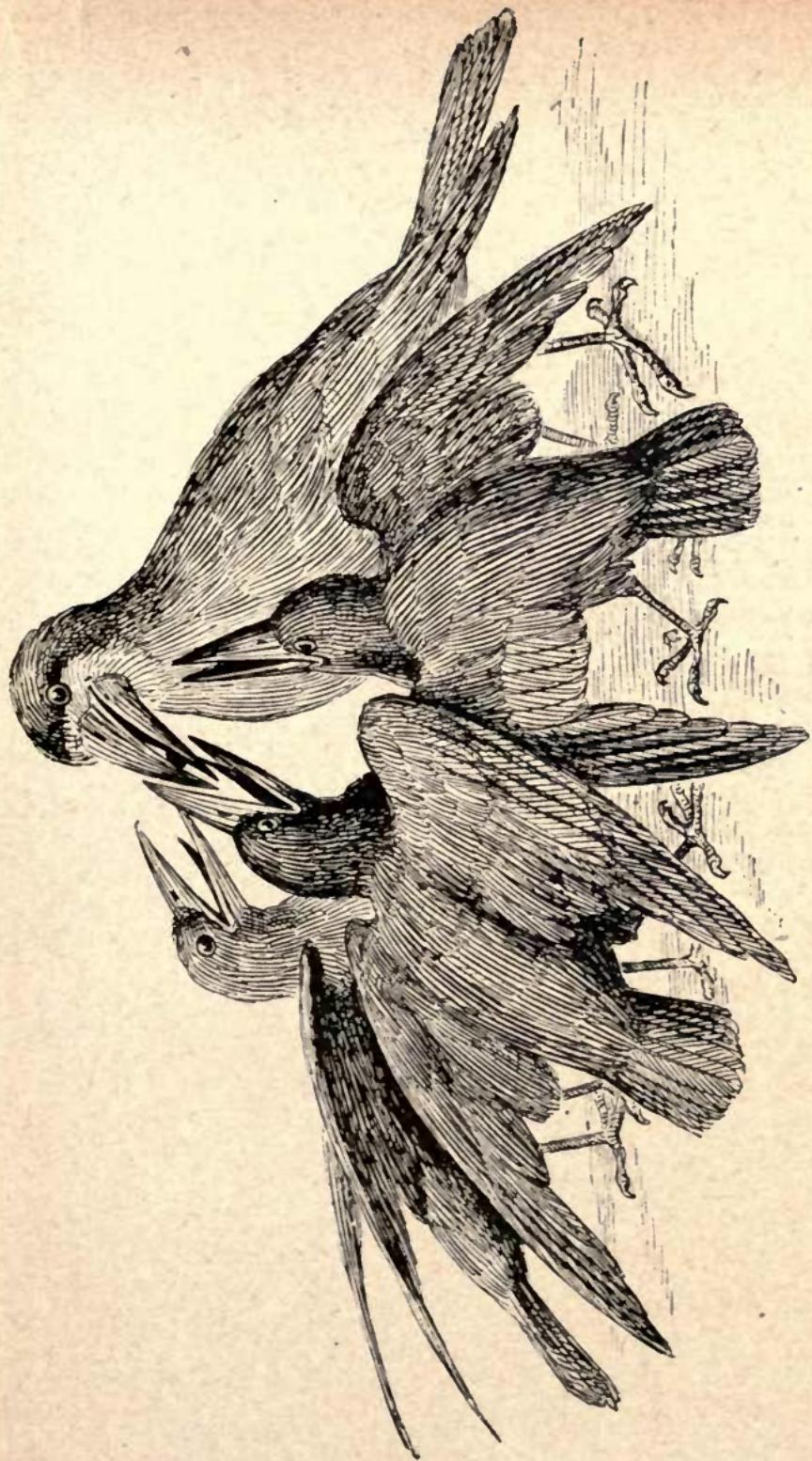
We could never find out where Mr. and Mrs. Merops built their nest, whether in the rookery amongst their neighbours, or in a place of their own choosing.

Time passed on, and we saw but one rook at the daily feeding-place, and therefore we concluded that the other was sitting. We speculated as to whether we should one day see Merops as a proud father with his children clustering around him. One fine May morning about six o'clock I heard a loud cawing and chirping going on beneath my window, and cautiously looking through the blind I was able to watch the very thing I had longed to see. Merops, as he is shown in the drawing, was surrounded by his clamorous brood, all with open beaks asking for food, flapping their wings and giving their parent no peace or respite, since as fast as he fed one another squawked and pressed forward, to be again displaced by a third greedy youngster who would take no denial. Poor Merops did his best, but at last he became fairly dazed and flew away, perhaps to ask his wife to help him with his overpowering family. This was my first glimpse of the young people; but we soon saw them on the lawn with their parents, and in time

they learned to come without fear up to the windows to be fed.

Long after they appeared to be fully grown and fledged they still entreated their parents to feed them in baby-fashion, and their good-natured father seemed quite unable to resist the touching appeal of a gaping beak and a wheedling squawk. In consequence of painters being at work upon the house for a month in the autumn, we lost sight of many of our pet birds, partly because they could not endure the presence of the workmen, and also because at that season they could find abundant food elsewhere, and were thus independent of our bounty.

When the frosty weather began, the faithful old rook appeared as usual, and, curiously enough, his mate stayed with him through the winter. The two might constantly be seen sitting side by side on the lawn or in the sun. If one of them moved a step or two away, the other would follow, so that in fact they seemed quite inseparable. When a deep snow covered the lawn it was amusing to watch the young rooks taking snow-baths ; it was evidently a new experience to them, and, like children at play, they flapped their wings and sent up showers of snow over each other's backs, cawing with ecstasy, taking in large mouthfuls of snow



MEROPS AND FAMILY.

and behaving altogether in a most riotous manner, Not so the old rooks ; they had often seen snow before, and were far too busy picking up grain to waste a moment upon idle play.

Now the pairing time has passed, Merops and his mate are probably upon domestic cares intent, and we shall in due time no doubt be introduced to another generation of the respected house of Merops.

BOBBIE THE BARN OWL

"Alone, and warming his five wits,
The white owl in the belfry sits."

TENNYSON.

SEVERAL years ago I was asked by a lady, who takes a kindly interest in all living creatures, if I would receive her tame barn owl in order that it might enjoy its liberty in my grounds. As we possess owls both brown and white, I thought it would be an easy matter to let the captive join his kith and kin in the tree-tops. It was thus that Bobbie came into my possession, and he proved to be a tame and friendly bird, though evidently very timid and in poor condition.

This being so, I thought it best to place him for a time in an outdoor aviary, where he was supplied with plenty of congenial food and had room to stretch his wings. After he had moulted and regained his health, I opened the door of his

aviary one evening, hoping to see the owl's first flight into the garden, and then perhaps away into



[P. Gosse.

BOBBIE THE BARN OWL.

the park in search of his wild relations. Bobbie, however, had no wish to leave his convenient lodgings ; he remained quietly on his perch gazing

at me with his great round eyes, evidently quite contented with his lot. I thought it only fair to suggest the delights of freedom by placing him upon the lawn, but after a few short flights he quietly returned to his familiar perch, thus plainly showing that he preferred to remain under my protection.

I have often repeated the experiment and always with the same result, so Bobbie is now one of my established pets, and lives in the conservatory in the winter, and in his outdoor house in the summer. During the day he elects to remain mostly in his rustic house, which is a box covered with rough bark, with a green baize curtain in front to afford him the subdued light which is usually desired by nocturnal birds. It is rather singular that Bobbie is an exception to this rule, for he will at times sit in the bright sunshine, and appears to prefer perching upon the top of his house to remaining inside. All the mice that can be obtained in the stable and farm buildings are sent in as an offering for the owl, and when this supply fails he has to be content with raw meat mixed with feathers.

Now, after some years of petting, Bobbie is absolutely tame, and will allow the friends he knows well to stroke his fluffy head and unfold

his wings ; he seems indeed to love to be caressed. He still dreads strangers, and especially children, with their sudden movements, and when he sees them, he instantly retreats to his inner chamber, where he stands quivering with nervous dread. I rather think that before my friend possessed him he must have had a dark past, and probably known what it was to be tormented by rough boys, so that the sight of young faces calls up distressing memories. When the conservatory had to be left in the painters' hands for several weeks, I kept Bobbie in the drawing-room. Then I learned how friendly and sociable the bird was, for, place him where I would on the floor, he always contrived to sidle round stealthily and ensconce himself upon the skirt of my dress as I sat at my writing-table.

Between many a sentence my hand has stolen down to stroke Bobbie's soft feathers, and whisper a word to my silent companion. The creature seemed to be perfectly happy thus to remain hour after hour if only I would keep quiet. The duties of daily life did not press upon him as they did upon me, and I was now and then compelled to interrupt his comfort by rising and leaving the room, upon which he would look at me reproachfully, and with dignity await my return.



[P. Gossé.

BOBBIE WATCHING STRANGERS.

During one of these brief absences a brilliant literary idea must have dawned upon Bobbie's mind, for on my return I found him standing amongst my papers, with one foot resting upon the lid of the inkstand ! He really would have made a pretty sketch, and I was quite sorry to have interrupted the bird of wisdom just when he was about to record his thoughts. It would be delightful to have a paper on things in general from an owl's point of view.

Another little episode which occurred almost daily whilst the owl was in residence in the drawing-room afforded us much amusement. For the comfort of my feet in cold weather an india-rubber bottle, covered with brown plush and filled with hot water, used to be placed beneath my writing-table. One day, in my absence, Bobbie happened to stand upon this bottle, and he found that it gurgled and squirmed and felt warm, and I believe he at once concluded that it must be stuffed with mice.

He lifted first one foot and then the other, and looked an utterly bewildered bird ; it was a sort of thing no owl could be expected to understand, and he evidently thought it uncanny, and at last, taking fright, he stalked away and stood looking at it from a distance.

Curiosity, however, overcame his fears, and he returned to make further experiments by seesawing on the soft, yielding surface, looking down with a gravely puzzled expression, quite ready to snatch up a mouse if one should happen to spring out of the mysterious thing.

Whilst the bird was a tenant of the drawing-room, he daily enjoyed this diversion, and exercised "his five wits" to their fullest extent in trying to make out the problem of a thing that possessed warmth, movement, and a furry coat, and yet appeared to have no visible connection with mice.

This mode of life was rather spoiling, and Bobbie began to resent being put in a cage for the night. He evidently reflected upon this as an indignity, and resolved to baffle me by hiding himself. As the dusk came on he watched his opportunity, and would steal noiselessly behind a sofa and secrete himself where he thought he would not be discovered. I felt sorry that, for his own safety, he had to be searched for and caged, but all through those weeks he cunningly devised a fresh hiding-place each evening, thus showing that he took real pains to think out the matter and obtain his own way if possible.

In a glass case near Bobbie's house there

resided during the summer months a number of Nile beetles, the Egyptian *Scarabæi*. These lively creatures greatly excited the owl's curiosity ; he would stand by the hour watching the movements of the insects with his head on one side, a very emblem of perplexed inquisitiveness.

To see an owl swallow a dead mouse is rather a startling experience to any one who witnesses it for the first time. The mouse's head is first taken into the capacious beak and slightly crushed, then with a sudden gulp the body disappears and only the tail is to be seen ; that also is disposed of by slow degrees, and a quiet period of meditation is indulged in while digestion goes on.

After a time another mouse is swallowed, and I have known Bobbie's dinner to consist of four or five of these rodents, indeed, of as many as could be secured for him. Unlike a cat, an owl does not torture its prey. One grip with its sharp talons kills a mouse instantly, so its end is quick and merciful.

We often hear the hooting of both white and brown owls in the summer evenings, and if we wish to see them it is only needful to listen for the loud outcries of the blackbirds in various parts of the garden, and we may rest assured that an owl is not far off. By a little searching we may

descry, perched high up in the tree branches, a great brown owl, patiently enduring the scolding and mobbing of the smaller birds, expressing in their strongest vocabulary their hatred of his presence. They do sometimes succeed in dislodging their enemy, and then he flies silently away, followed by a flock of angry birds, sparrows, finches, blackbirds, and even starlings all combining to drive away the intruder.

AN EGYPTIAN PET

WHEN I first heard that a lady in my neighbourhood possessed a live bulbul, my thoughts flew at once to Tom Moore's "Lalla Rookh," with its visions of moonlight serenades, dark-eyed beauties, and all that surrounds the Eastern harem life. I had, in fact, only a vague notion that the bird was a sort of nightingale more or less resembling our own sweet woodland singer. I was, however, destined to know more about it, for it has come to pass that I have now the precious bulbul in my care whilst its owner is absent from her home. Possibly a few notes about such a rare bird may prove of interest to Nature-lovers.

There are several species of the bulbul; this particular one came from Egypt, and is often called the Persian nightingale (*Pycnotus xanthopygius*). In appearance it is quite unlike an English nightingale. The head, throat, tail, and legs are jet black, the rest of the body being a uniform grey tint with a patch of bright yellow beneath the tail. In size the bird is between a

starling and a robin, sleek of plumage, well built, full of activity and intelligence ; its black eyes with their prominent grey rims are ever on the watch for mischief of some kind ; evidently the bird's active brain must find an outlet in action, and in consequence, when released from its cage, it is never still for a moment.

Soon after five o'clock in the morning I open Bully's cage door, and with a joyous whistle of delight the bird flies to me, and perching on my hand, invites attention by his quivering wings and low warbles of affection. Bully is like a parrot in loving to have his head and throat caressed ; while I tickle his plumage, he opens his beak quite wide as a token of appreciation, softly holding my finger at intervals and pinching it more and more as if to ascertain how far I can bear the pressure without flinching.

Whilst I am quietly reading, I can well observe the habits of this lively bird. He delights in turning over all, he can find upon my toilet-table, and one by one, scissors and buttonhook, collar and cuffs, everything portable, is thrown down upon the floor. One morning I was surprised to see a sort of tropical butterfly careering through the air, but it was only Bully, chuckling with delight as he bore my lace tie round and round

the room, evidently in great spirits at the amount of mischief he had already done in scattering my small properties, but now still more enjoying a triumphant flight with his new trophy. I only mention these trivialities to show the bulbul's active, vivacious nature, and how he certainly can lay claim to the character of a very entertaining companion.

I cannot say the bulbul has a very pleasing voice ; its song consists of a great variety of loud clear whistles monotonously repeated. When left alone I sometimes heard Bully warbling rather prettily to himself, and I should fancy if patiently instructed when quite young, such an intelligent bird might be taught to whistle tunes, or even to speak a few words.

This bulbul often reminds me of my beloved Virginian nightingale, Birdie, of whom I have given the biography in an earlier volume ; Bully has the same kind of quick, bright manner, and certainly no bird could well be tamer or more affectionate ; he seems perfectly happy if allowed to sit on my arm or shoulder and feel the touch of a kind hand caressing his soft feathers. Bully's diet consists of fruit, either dried or fresh, mealworms and flies, and some soaked bread as a variety. When set at liberty, before doing anything else, he

makes it his conscientious duty to kill every fly in the room, so his presence is highly desirable during the summer months, when all kinds of winged creatures seem to flock to the window-panes. One morning I found twenty-one dead bluebottles slain by the bulbul, who, with erected crest, stood whistling joyfully over their remains.

Seeing his own reflection in the looking-glass draws forth his sweetest warbling notes, for, with all his high intelligence, the bird seems always deluding himself with the idea that he has found a mate, to whom he whistles with much unavailing ardour.

When I first uncover the bulbul in the early morning, his joy and affection seem to throw him into a kind of ecstasy, he humps up his back, and depresses his head and tail, opens wide his beak and gurgles forth a sweet and touching greeting of deep affection, swaying his head from side to side ; as he sings he gazes at me, too entranced to think of food, or liberty, or anything but love.

I have never before heard of a bulbul kept in captivity in this country, but the habits of the bird are so charming, and its ways so playful and full of character, that it seems to combine almost all the qualities one can desire in a feathered pet, and one cannot but recommend it to students of domestic bird life.

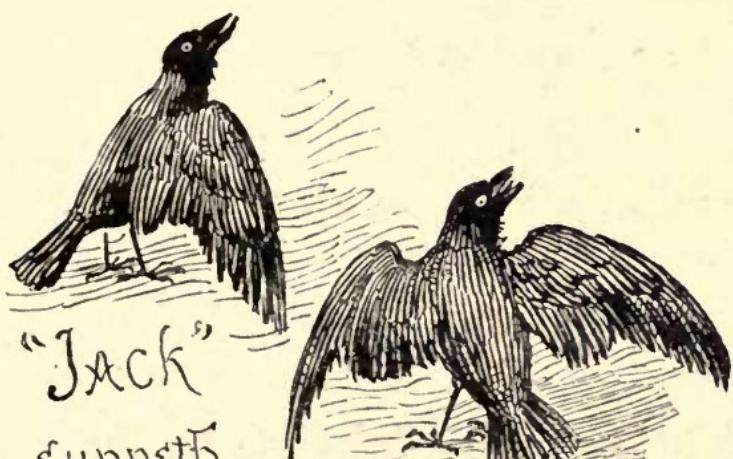
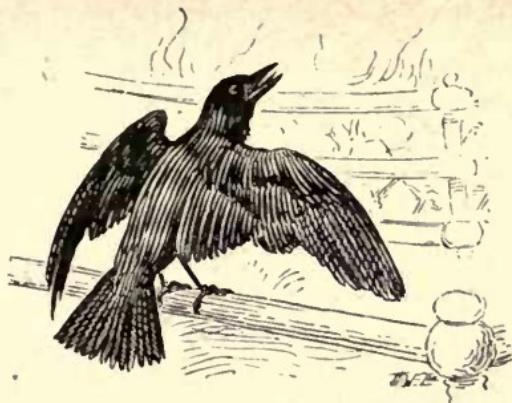
MISCHIEVOUS JACK

I AM gradually learning to estimate rightly the responsibility of having a jackdaw loose upon the premises.

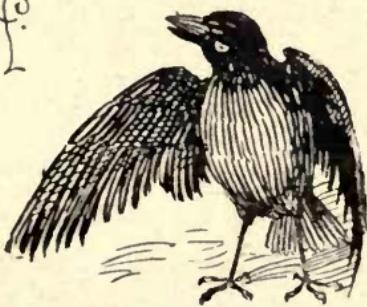
There is really no way of circumventing Jack's craftiness except by keeping him shut up all day in an outdoor aviary. I feel sorry to be driven to this course, and would far rather let him roam where he pleases; but his mischievous pranks have become unendurable.

I thought to-day I had made a great discovery, and that by placing a large stuffed flamingo at the open French window I should effectually frighten the jackdaw from entering.

I found him in the drawing-room on my writing-table busy about some evil deed, so I held up the great stuffed bird, at which Jack cast one horrified glance and then fled precipitately out at the window as if his last hour had come. Now, I



"Jack"
sunneth
himself.

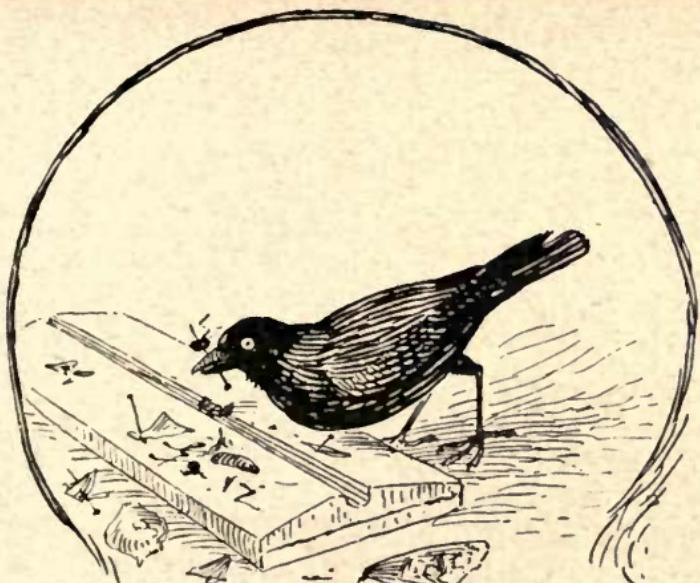


thought, by placing the flamingo near the window, I could leave the room with an easy mind. Vain hope ! I came back after a few minutes and found the impertinent jackdaw hopping about as happy as a king. He had pulled to pieces a rare foreign insect I had just been setting on a piece of cork. He had overturned all the small curios he could find, had pulled all the pins out of a pin-cushion, and, worst of all, he had opened a Mudie book and torn its map and pages to ribbons. That book will have to become my property and remain a monument of Jack's misplaced energy.

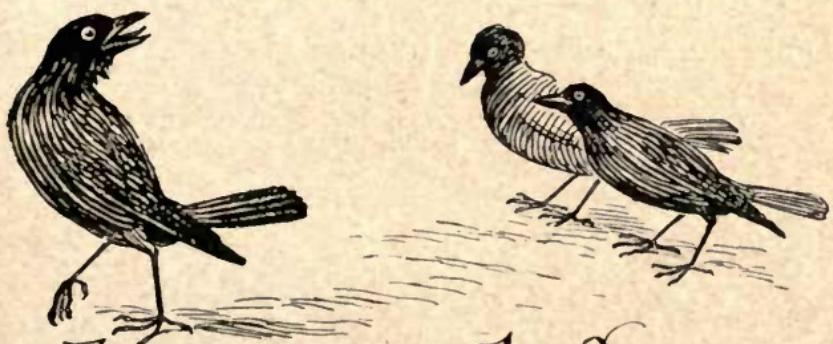
It was humiliating to think how he must have ignored my flamingo. He had seen through the device at once and had no idea of submitting to be scared away by such a bogie.

During the winter months we do not often have weather which will admit of open windows, so Jack exercised his talent for mischief out of doors by hiding the padlock of the aviary, pulling up flower labels, and drawing nails out of the walls. In these varied occupations he managed to spend his hours of idleness.

As a rare treat he was sometimes allowed to bask on the fender before the fire, and, charmed by the delicious warmth, he would assume the various attitudes shown in the illustration. His



He studieth Entomology



He despiseth the Fair Sex

wings and tail expanded, his head on one side and beak wide open, he looked like a dying bird, but we knew that in reality he was in a state of ecstasy.

When next summer arrived Jack was again kept in the aviary, and I am sorry to have to reveal a very dark page in his moral character. He was usually content with raw meat and sopped bread ; but, alas, he much preferred to catch his own dinner ! And when, attracted by his food, innocent little robins, chaffinches, and sparrows found their way into his domain, I grieve to record the dreadful fact that none came out alive ! Jack feasted on their small bodies, and left only a little bunch of feathers to show what he had been doing.

I have said enough to prove that Jack is neither to be loved nor respected ; but he is unquestionably clever, and evidently has his own thoughts and ideas.

He will fly at one's hand like a fury even when food is being given him ; but when his mood changes and he wishes to be caressed, he picks up a twig or a dead leaf. This is a signal of peace, and whilst he continues to hold it in his bill he is quite safe, and may be stroked and petted.

One day in the height of summer Jack was



arrangeth the Table.

perfectly electrified by a visit from six lively young magpies. The aviary door happened to be open, and these birds came hopping in with their usual free and easy manner, chattering to each other and coolly abstracting any morsels of food which suited their taste. At first Jack tried to drive out these audacious visitors, but they ignored him altogether and at last he had to stand aside and watch their depredations, a very discomfited and astonished bird. The magpies came at intervals for several days in succession, and then I suppose they went off to the woods, for we saw them no more.

It is rather curious that the mating instinct has not led Jack into the bands of matrimony. I have seen several attractive specimens of his own kind making overtures to him, but he treats them all with lofty disdain and prefers to remain a bachelor.

Perhaps next year he may yield to the fascinations of a wild mate, and settle happily somewhere in my woods. It would be the best thing that could happen, and I fear we should all eagerly bid him goodbye without the addition of *au revoir*.

ORTOLANS

(*Emberiza hortulana.*)

YES, I must confess the ortolans were an utter failure!

I saw the name in a list of living birds for sale, and immediately my thoughts went back to old Roman times, when no banquet was deemed complete without its dainty dishes of ortolans served in a hundred ways known to the famous chefs of antiquity.

Not having ever seen the bird, I did not know whether it was large or small, beautiful or commonplace. It was to me only a romantic name, but somehow I could not resist taking advantage of this opportunity of becoming the possessor of a pair of birds of such historical interest. Great, therefore, was my disappointment when I opened the basket in which they had travelled from London, to find two dingy birds,

very like sparrows in size and colouring, wild little creatures fluttering about in their cage, looking very miserable and unpromising as pets.

As they evidently required more space, I let them loose in an outdoor aviary with a grassy floor and plenty of room to fly about.

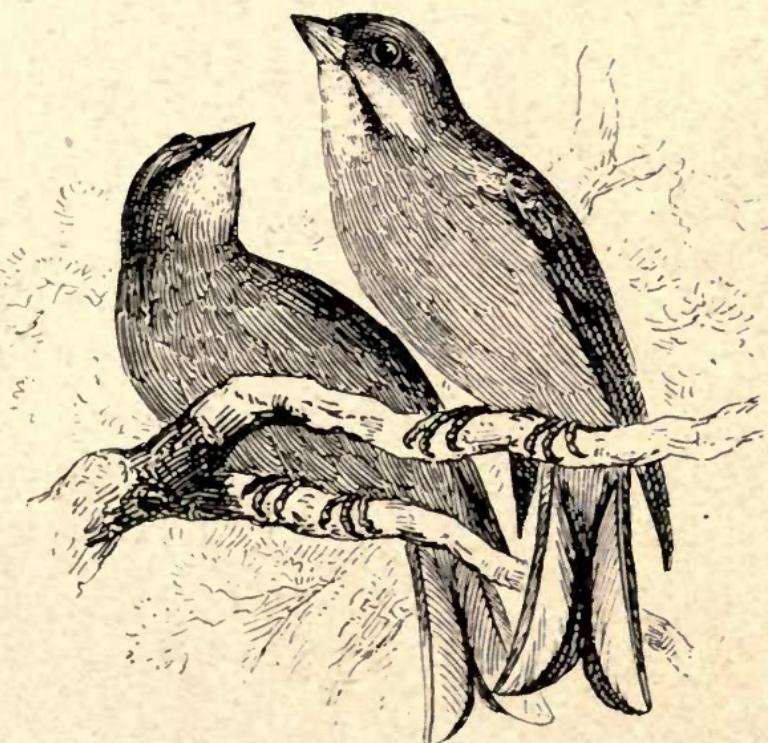
So pleased were they with this change that one little captive presently lifted up his voice and sang a sweet little warbling song. This was the first and only time that I ever heard either of them attempt to sing.

For several months I tried my best to make the ortolans happy and to induce them to form a nest in a secluded corner of the aviary where building materials were supplied, but they were entirely unresponsive. They chirped, they basked in the sun, they became in good condition, with sleek plumage, and they developed excellent appetites, but as a little girl once remarked, "they wouldn't have any habits." So on a bright summer's day I opened the aviary door and let the captives go where they pleased.

They remained near the house for a few days, and then I saw them no more.

North Africa is believed to be the winter resort of this bird, so it may be that my released captives enjoyed a few months' residence

in our woods and fields, where they would find insects and grain of various kinds, and that then instinct taught them to migrate to their own country.



ORTOLANS.

There are establishments in the South of Europe where these birds are caught on their way south in large numbers ; they are then fed upon millet seed until they are plump and fat enough for the fate which awaits them.

I had the curiosity to look in a modern cookery book and found more than a dozen recipes for serving these poor little victims of gastronomic luxury.

ANCHOR

A STAG-BEETLE STUDY

PEOPLE in general do not consider a beetle an interesting pet. A butterfly or moth may be tolerated, a grasshopper may have some redeeming qualities, a certain tame wasp has received much public notice, and ants are positively fashionable as subjects for study: but a beetle is generally characterised as "horrid," and any one liking such a creature is at once considered eccentric. Nevertheless, I am prepared at all risks to say a good word for my pet stag-beetle, and shall endeavour to create a sympathetic interest in an insect which I, at any rate, have found worthy of attention and study.

It has never been my lot to reside where these beetles are found; they only occur locally, and yet in certain English counties they seem to exist in abundance. A fine male specimen, with well-

developed horns, was forwarded to me from Kent, but, unfortunately, it arrived when I was absent from home. As no one in my household seemed to covet the task of caring for the beetle, a council was held, and it was decided that the insect should be again committed to the tender mercies of the post, and forwarded to me in Hampshire.

I feared that thus having had to travel through no fewer than four counties, I should find that the poor beetle had died on the exhausting second journey, but, on the contrary, when I opened the box he lifted up a formidable pair of antlers, and surveyed me with a glance of inquiring surprise.

The most important matter in keeping a pet animal is to ascertain its congenial food, and endeavour to make it as happy as possible in captivity. Insects in this respect present a peculiar difficulty, as one hardly ever obtains any help from books. One may take down a scientific work on beetles, for instance, and find *Lucanus servus*, the stag-beetle; then will follow a full description, probably in Latin, of all its parts, and some slight sketch of its life-history, but about its daily food a discreet silence is sure to be maintained. This is probably on

account of the difficulty of obtaining exact information upon that point. This difficulty is increased in the case of nocturnal insects which, like the stag-beetle, fly about in tree-branches, where, no doubt, they find some sort of food when they are far beyond our reach and sight.

All I could do was to offer my new pet one thing after another, in the hope that I might at last hit upon a diet suited to his taste.

He very decidedly disapproved of meat, insects, bread or grain, so I was puzzled to think what next to offer. Having read somewhere that the horns of this creature are said to be used for piercing the bark of trees in order to obtain the sap, and supposing it might be of a sweet nature, I thought that possibly sugar might be acceptable; a small lump was moistened with a few drops of cream, and for half an hour I could see the beetle's mouth-apparatus sucking in the sweet food with great apparent relish.

He lowered his horns so as to hold the sugar firmly between them, and seemed quite intent upon this dainty, which he certainly must have tasted for the first time in his life. After a time I discovered that strawberry jam, or a piece of banana served with cream and sugar, entirely met the taste of this highly-refined and luxurious beetle.

Now occurred the necessity of finding a name appropriate to the new pet, and it was soon suggested by one of his personal habits. It is needless to say the creature possesses six legs, and each leg terminates in two curved hooks ; by all these twelve hooks the beetle clings with might and main to whatever it is resting upon. I could not help frequently remarking, "Here is this creature anchored to my shawl again," and in this way the new pet obtained his name of "Anchor;" I must admit that ever after he lived up to his title.

The stag-beetle's name and diet being settled, a home was the next thing to be arranged. For the first few hours the creature roamed about upon the table and kept appearing in unexpected places, greatly to the terror of the hotel maid-servant, who dared hardly enter the room to lay the cloth for luncheon ; her first sight of Anchor's uplifted horns evoked such a loud scream from the poor maiden, that I was compelled to devise some method of keeping the beetle in discreet custody. A glass box, with one side left open for air, enabled me to watch his habits when at his ease, and formed a travelling-cage in which Anchor reached The Grove in safety.

It may be of interest to my readers to be told something of the life-history of this, the largest of our English land-beetles. The stag-beetle is a member of the *Lamellicorn* family of beetles, a word signifying "leaf-horned," a term applied to those beetles whose antennæ are composed of a series of flat plates, or leaves. The male alone possesses the antlers, from which the species takes its name; the female has small but powerful jaws, with which she can bite severely,



STAG-BEETLE CHRYSALIS.

and is on that account a more formidable insect than her mate, who, as far as my experience goes, never uses his horns offensively.

My specimen is rather more than two inches in length, of blackish-brown colour, holding his well-armed head erect, as if he felt himself a very king amongst other beetles. Some decaying oak or willow trunk is chosen by the female beetle as a nursery for her eggs, which she deposits in a little hole dug out by her powerful

fore-legs. Several writers appear to think that the larva of this beetle was the *cossus* of the Romans, which they regarded as a delicacy.



ANCHOR FEEDING.

Even without the fattening process to which it was subjected in those olden days, it grows in the course of four or five years into a huge



ANCHOR ANGRY.

ungainly grub, with legs which are so short that it cannot walk; it only rolls sluggishly along upon its side, feeding upon rotten wood. When full grown it builds a cocoon out of chips of the

decayed wood around it, and turns into a strange kind of chrysalis, in which the form of the future beetle can be distinctly traced. The insect in its perfect state does no damage to tree-trunks, seeming to prefer abiding amongst the upper branches.

My interesting captive proves to be very fond of water; plunging his head below the surface, he will continue drinking for a minute or more,



ANCHOR PLAYING.

and when thus engaged, or sucking up his sugary food, his horns are always kept closed. At other times they are slightly apart, but if at all irritated Anchor holds himself very erect, with the horns widely opened in a menacing attitude; it appears, however, to be only a menace, for he has never attempted to use them defensively, or laid hold of my finger when I lifted him out of his box.

Only once did I see Anchor really use his horns in any way, and that was in a grotesque

sort of fashion, for he caught up his lump of sugar and flung it up two or three times, playing ball with it, as if in a merry mood.

I should much like to see the gauzy pair of wings that I know are lying, neatly folded, under his black wing cases, but nothing will induce Anchor to unfold them. No doubt, were he to find himself in the dusky twilight of a warm



STAG-BEETLE FLYING.

June evening on the topmost bough of an oak-tree, he would soon take flight and join his kith and kin, as they sail heavily to and fro on work or play intent.

On the inner side of each fore-leg there is a patch of yellow down, which, when examined with a lens, is seen to be a little velvet brush, and with this the beetle is able to cleanse its antennæ.

I often watch Anchor doing this, drawing his antennæ completely back, so as to bring them in contact with the yellow brush on each fore-leg, until every speck of dust is removed.

When I had fed and tended Anchor for about a month, I became absolutely certain that the creature knows me, for if placed on the lawn he will follow me in any direction; as I go to the right or left, so he alters his course, not as a mere accident, but invariably. How long this curious insect may survive his artificial life I do not know; now, at the end of five weeks, he appears to be in excellent health, and enjoys his daily exercise and repasts of sweet food. In studying my stag-beetle's habits I have become more than ever persuaded that, even in forms comparatively so low in the scale of life as insects, there is much of personal and characteristic habit to be observed by those who will give close and patient attention to these humble forms, not mouldering in a glass case transfixated by a pin, but in a living captivity, made agreeable for them by a careful consideration of their needs and probable pleasures.

TREES I HAVE KNOWN

THE TULIP-TREE

(*Liriodendron tulipifera.*)

A BOUT a hundred years ago this old home of mine must have been occupied by some one to whom I am much indebted for having planted rare and curious trees in its grounds. They are admirably placed both for their own expansion and for artistic effect; and being sheltered by the woods and plantations which surround this place, they have, so far, attained full maturity without losing any of their main branches.

The central ornament of the south lawn is a tulip-tree, of which I am afraid I am almost sinfully proud! It is impossible to help admiring such a noble specimen of a beautiful tree. It stands alone in all its grandeur of ninety feet, and its massive trunk, which is unbranched for about ten feet, measures eleven feet in girth. The stem then divides into six pillar-like branches, each as large as an ordinary tree. The lower branches

curve downwards and rest upon the ground on all sides, thus forming in summer a delightful shady tent, which is known as our green drawing-room.

The soft grasses which form the carpet are embroidered with the flowers of blue and white milkwort, veronica and wild violets.

The hammock which is slung from two of the huge branches is a place to dream in through a summer's day. As one looks up into the leafy canopy, one watches the flitting of the birds to and fro, and notes the difference between the golden green of sun-lighted leaves and the deeper colouring of those in shadow; the stillness meanwhile is only broken by such soothing sounds as the hum of insects or the love-notes of the birds.

When July comes, then our tree is adorned with hundreds of curious flowers. These are borne terminally on the outer branches, which all curve upwards, bearing lily-shaped blossoms, and thus has arisen its name of *Liriodendron*, which means lily-tree. From the unusual form of the leaves it is sometimes called the saddle-back tree.

The flowers are of a light vivid green with a splash of rich salmon colour on each petal, the stamens being of a deep orange. The tree is a native of North America and may be met with from Canada to Florida. In our climate it seldom

FLOWERS AND FRUIT.



ripens its seed, although it produces cone-shaped fruits which remain upon the tree until late in the autumn.¹

The North American Indians find its light firm timber suitable for making their canoes, but in England its chief use is for carriage panels; it has a fine grain, on the polished surface of which designs can be accurately painted. It is therefore in much request for the heraldic decoration of vehicles.

The buds of the tulip-tree are always the latest in my garden to unfold, and their arrangement is singularly protective. Each leaf is folded in half and then bent double, and a pair of large pale green bracts enclose the leaf.

If we take away the bracts and the outer leaf we find another smaller leaf folded and sheltered in the same way, and beneath that another leaf, and so the bud contains the entire leafage of the twig. This curious arrangement is shown in the drawing, where one leaf is represented as fully expanded, one still folded in half and some only just emerging from their protecting bracts. As

¹ It may be well to explain that the beautifully-striped rose-coloured wood so highly prized by cabinet-makers for inlaying purposes, and which is known as tulip-wood, is the product of a Brazilian tree, *Physocalymma floribunda*.

each spring returns I love to watch this unfolding of the tulip-tree buds, so delicately fresh and tender are the young leaves, while the whole arrangement shows creative wisdom and design



TULIP-TREE BUD.

for the protection of the fragile leaves in their early stage.

When summer begins to wane, the tulip-tree is the first to show yellow tints as a sign of its coming glory. A few early frosts cause the leaves

to deepen rapidly in colour until the huge tree is a blaze of golden yellow, and when the sun shines upon it, the whole garden seems to be illuminated. I have a large painting of the tulip-tree in its autumnal beauty, which, standing upon an easel in a dark corner of the drawing-room, has a similar effect of lighting it up as with rays of sunshine.

I always regret the short time in which we can enjoy this glowing foliage ; the first high wind or severe frost loosens the leaves and gradually a rich golden carpet is spread beneath the tree. I do not allow this to be cleared away until we have watched the various changes of colour from chrome yellow to red brown. Finally the leafy *débris* is removed, and the space beneath the tree becomes the feeding ground for innumerable birds throughout the winter. On a frosty day in December hundreds of rooks may be seen greedily enjoying the wheat and barley which I have had strewn there for their benefit.

Stately pheasants take their share of the good things, and a busy squabbling crew of smaller birds flit to and fro and satisfy their needs. So the grand old tree becomes a rallying-place for all my feathered friends, and, being in full view of our windows, affords us many a pleasant glimpse of nature.



TULIP-TREE IN WINTER.

THE ELM

(*Ulmus campestris.*)

“When the Elmen leaf is as big as a farding,
‘Tis time to sow kidney-beans in the garding.
When the Elmen leaf is as big as a penny,
You must sow kidney-beans if you wish to have any.”

Old Rhyme.

If only for its especially beautiful tints in autumn, the elm ought to be one of our favourite trees. It is, I think, almost as well known as the oak, and nearly as widely distributed. Being found so frequently in hedge-rows, marking out the boundaries of fields, its fate in that position is almost invariably to be mutilated and lopped to prevent it unduly shading the crops. If, therefore, we wish to see this tree in perfection, a specimen must be sought in open ground where it has been permitted to develop its noble trunk and branches. The elm shown in the



[J. Leversuch.

ULMUS CAMPESTRIS.

photograph stands by my lake, and is "a thing of beauty" every autumn ; its rich golden colour is enhanced by the dark foliage of the Scotch fir behind it, and, as it is so situated as to catch the last rays of the setting sun, it glows at that hour with a wonderful vividness of colouring both in its spring and autumn dress.

According to the quaint old quatrain the budding of the elm would seem to have been regarded in earlier days as a useful guide in the matter of seed-sowing. Even now, as the re-leaving of trees varies much from year to year, according to the weather, it is possible that the guidance of the elm may not be without a certain value for the observant gardener. The blossom of this tree is produced mainly on the upper branches, and so early in the year that it is seldom observed. The flowers are small, but they cover the twigs so profusely as to give a rich, reddish-purple tinge to the upper part of the tree in early spring.

As they wither and fall off, they are succeeded by pale green flat seed-vessels called *samaras*. In the case of the wych elm these cluster so thickly on the branches as to give the effect of young leafage.

Sir Joseph Hooker in his "Student's Flora" speaks of the elm as "an extremely variable tree,"



FLOWERS AND SAMARAS OF *ULMUS CAMPESTRIS*.



CORKY-BARKED ELM
STEM

so it may be well to describe rather minutely some of its varieties.

Ulmus campestris is the species we find everywhere in fields and hedgerows. It is a lofty upright tree with rough bark and widely spreading branches. Where fully grown, it often attains a height of seventy or eighty feet, with a trunk of massive girth.

Its seed is placed in the upper part of the pale green *samara*, whilst in the wych elm we find it in the centre of the seed-vessel. This will guide us to distinguish between the two trees in early spring. Later on in the year the much larger leaves of the wych elm, their regular alternate growth on the twigs and their much deeper serrations, afford us still more definite indications of the species.

A variety of the common elm (*Ulmus suberosa*) develops thick ridges of corky substance on its branches. The cork is soft and brittle and appears to be of no special use to the tree. The formation of this cork is somewhat uncertain, as many trees may be seen without any such development, whilst others, growing under the same conditions, have even the smallest twigs thickly covered with cork ridges.

Again it often happens that where a smooth-stemmed elm is cut down, the young shoots which spring up are coated with cork.

The *Ulmus montana*, or wych elm, has extremely graceful drooping branches, and is one of our most ornamental trees. It is a native of Scotland, and is found not only on the plains, but endures the cold of the Highlands. All varieties of the elm have oblique-shaped leaves, but this is more especially the case with the wych elm ; its strong, vigorous shoots bear large leaves so curved and far apart that each receives its due proportion of sun and air.

Other kinds of elm are *Ulmus minor*, which is densely clothed with small leaves, *Ulmus glabra*, a smooth-leaved variety, and *Ulmus carpinifolia* with leaves resembling the hornbeam. I happen to possess a well-grown young elm which bears

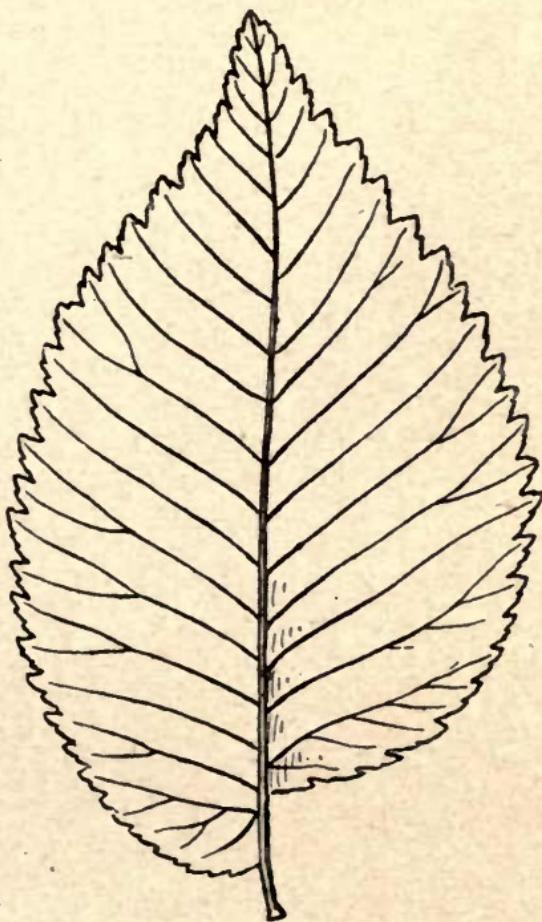
cream-coloured streaked and spotted leaves ; this is merely a sport of the common *Ulmus campestris*, but seen amongst the dark green foliage of other trees, it is highly ornamental.

It is somewhat difficult to trace the origin of the elm, but at any rate, it is known to exist in North America, Siberia, and North and South Europe ; and since *campestris* never ripens its seed in England, it rather points to its needing a warmer climate to enable it to do so, and would lead one to believe it to be an imported tree.

There is no doubt that the elm has been a common tree in England from very ancient times, from the fact noted by Evelyn that in the Domesday Book, which dates from 1068, there are more than forty places bearing the name of this tree, such as Elmhurst, Elmstead, Elmham, and others. Cambridgeshire and Oxfordshire each possesses a village named Elm.

We may now consider the uses to which elm timber is applied. It is remarkable for its durability under the action of water, and is therefore in great request for piles to keep up the banks of rivers, and for drainage purposes. In making some alterations on this estate, the workmen found a drain of very ancient date formed of elm-trunks hollowed out and used as a conduit. These

specimens of elm-wood were in a serviceable and undecayed condition, and showed what must have



ELM LEAF.

been in use long before earthenware and metal pipes were introduced.

The roughness and rigidity of elm timber makes

it specially suitable for the wheelwright, who uses it for making barrows and farming implements.

Virgil speaks of young elms being bent down while growing and tied in such a position that they would eventually form the curved handles required for ploughshares. The passage is thus translated in Lord Burghclere's beautiful version of "The Georgics":—

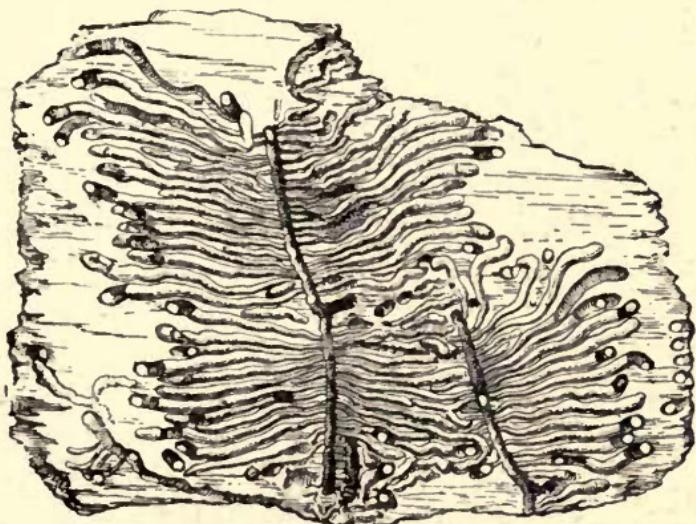
"Now in the forest bend the living elm
With thy full vigour, beam-wise moulding it
Into the curved shape of a plough."

Elm timber is used for the keels and gunwales of ships; it is not liable to split, and bears the driving of nails and bolts better than any other wood.

It is interesting to note how various are the purposes for which elm timber is suitable. Axle-trees and coffins, trunks and chopping blocks, palings and tool-handles are all made of this valuable tree. Evelyn speaks of elm wood, from the tenor of the grain and its toughness, as being "particularly well fitted for those curious works of fruitages, foliage, shields, statues, and architectural ornaments" in which the ingenious artists of his

age delighted. The roots also, and the huge wens or excrescences which are sometimes found upon the branches, afford beautifully mottled and veined material for cabinet-makers.

The tree is preyed upon by a specially noxious beetle, *Scolytus destructor*. The perfect insect



SCOLYTUS BEETLE.

feeds upon the inner bark of the tree, and the numerous holes it makes interfere with the flow of the sap, and also admit moisture. The tree becomes sickly, and it is then perforated by the female beetle. She bores a passage some two inches long, and lays in it at intervals from thirty to forty eggs. She then dies, and in about two

months the eggs are hatched, and, as will be seen in the drawing, the grubs eat their way along right and left until they are full grown. They then turn into chrysalides, and finally into beetles ready to begin their devastating work on other trees. It is said that as many as eighty thousand beetles have been found upon one tree.

There seems no cure for this pest, but the radical one of cutting down the tree and burning every particle of the bark. The beetle itself is less than a quarter of an inch in length, but as it exists in such amazing quantities, it forms in some localities a very serious hindrance to the growth of elm and ash woods. If we happen to see a loose piece of bark on an elm or ash-tree, it is very probable that on lifting it up we shall find the curious pattern being engraved on the wood beneath by the jaws of this destructive insect.

THE SCOTCH FIR

(*Pinus sylvestris.*)

ON a rising slope of my lawn stands a noble specimen of the Scotch fir. During a century of years it has grown undisturbed by the hand of man, and in that time it has developed a stem nearly a hundred feet in height, with massive branches on all sides. I have often wondered whether this fir was self-sown or was planted where it now stands.

It is but seldom that a tree has the opportunity of growing symmetrically for so long a period with abundance of space, air and light for the perfect development of its stems and branches.

A young seedling runs many risks of injury. Not only is it liable to suffer by human agency, but the chance nibble of a rabbit or the ravage of a swarm of insects may end its life in a moment.

The tree must have survived these dangers and grown year by year through winter's storms and summer's drought, sending down mighty roots to support the weight of timber we now look upon. The stem at eighteen feet from the ground is twelve feet in circumference, and it has been calculated that it and the branches contain more than twenty tons of timber.

I do not think there is any other tree (unless it be a cedar of Lebanon) that lends itself so well to varied atmospheric effects as does a Scotch fir. I have enjoyed the beauty of this tree for more than thirty years, and from sunrise to sunset it presents to the eye a series of charming compositions, of which it is the centre. The charm mainly arises from its varied backgrounds. The tree itself changes but little except to put on a rather brighter tint of green in early summer. Its full rich evergreen foliage endures patiently the extremes of heat and cold to which our variable climate exposes it. At sunrise in early summer the sky behind the fir-branches is often flecked with rosy pink cloudlets on a pale blue ground. The level rays of sunlight just touch some of the outermost branches, bringing them into relief against the darker boughs, and thus giving the light and shade which makes a transient



SCOTCH FIR.

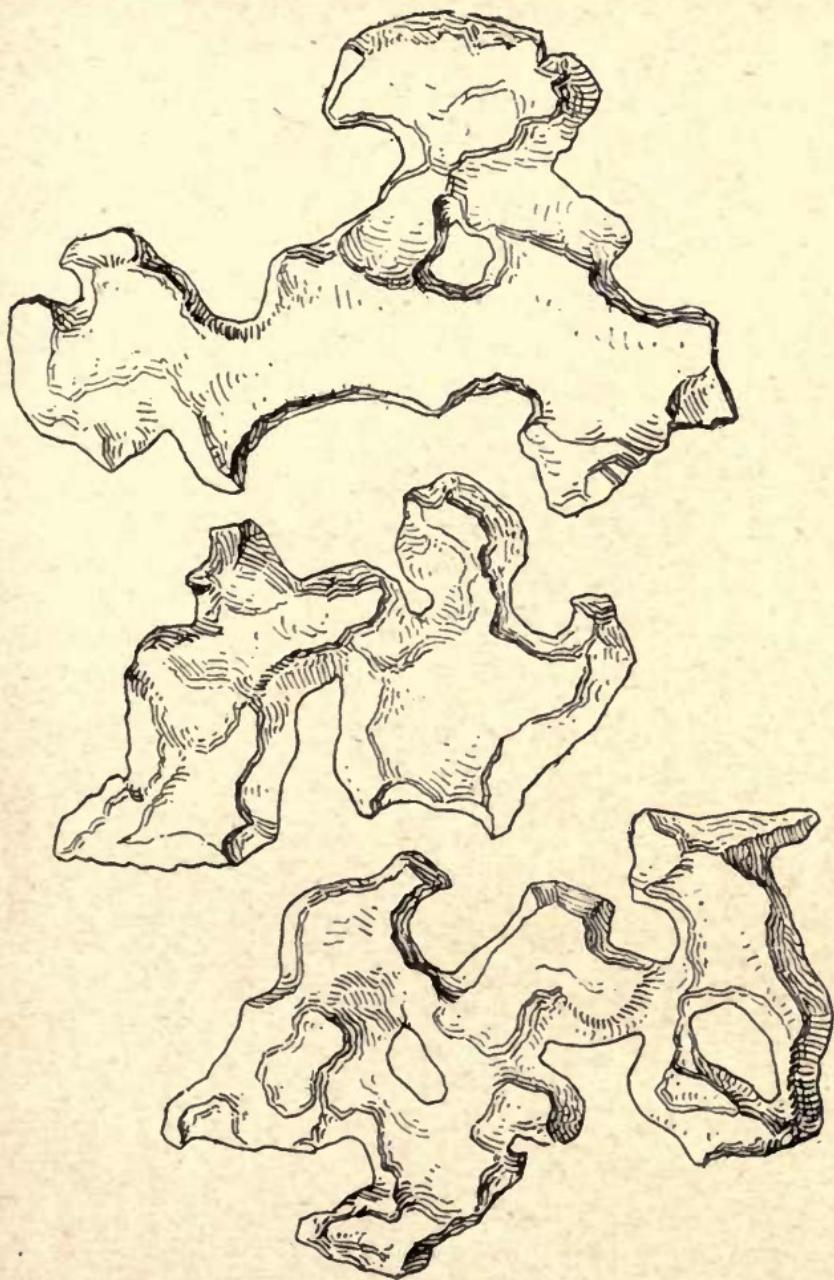
effect into a picture. Often have I longed to sketch it, but it is too evanescent. That particular effect only lasts for a few moments, and is retained as a mental impression only. Another early morning effect is to be seen when the garden is bathed in dew and a pale blue mist envelops everything with a veil of poetic mystery. The fir is then only partly visible. Not a leaf is moving. All Nature revels in the refreshing dew by which trees and shrubs are enabled to live through long weeks of parching drought and still retain the greenness of their foliage.

In summer the pollen-laden blossoms add a somewhat golden tint to the fir-branches and fill the air with a mist of yellow powder whenever a passing breeze disperses it far and wide. The rich red colour of the Scotch fir bark is beautiful at all times, but it glows like burnished copper when lit up by the rays of the setting sun.

I love, as I sit between my Scotch fir and the west, to watch this illumination creeping higher and higher as the sun sinks, until it reaches the crest of the tree, then ceases, and the grey mists of evening steal over the quiet garden.

Very occasionally we are treated to a rather startling effect. Lurid thunderclouds form the

FIR BARK FRAGMENTS.



background. The fir-branches appear to be of a light metallic green by force of contrast. One is prepared for the lightning-flash and the roll of thunder, when suddenly the setting sun shines out, and the effect is weird indeed. It is like a scene at a theatre when coloured lights are turned on. No words can describe the intensity of colour and the strangeness of the effect.

The trees are so placed in this garden that in the evening the foreground and background lie in deep shadow. The middle distance only is lighted by the rays of the setting sun shining through a narrow gap in the belt of trees which surrounds this estate. Hence, by force of strong contrast of light and shade, we are treated to these beautiful and striking effects of sunlighted foliage.

Once more we will change the scene to the depth of winter. Then our great fir puts on its grandest aspect. Each branch, snow-laden and covered with glistening frost crystals, set off by the crimson and gold of a sunset sky, forms the centre of a landscape of surpassing beauty. The stillness which generally accompanies a hard frost, sometimes permits us to enjoy this special effect for days together, the tree standing out white-wreathed against varying backgrounds of

pale and dark blue, saffron and crimson, with the added beauty of ever-changing clouds. As night comes on all colour fades away, and the great branches assume an almost inky blackness against the sky, until, as the moon rises behind the tree, another picture of special beauty is afforded us. The silvery light just touches the stem and branches here and there, leaving the rest in deep shadow, and as cloud masses come and go, the wavering glints of light compose an ever-varying scene of calm beauty of which I never weary.

The Scotch fir is, I believe, the only pine-tree that is native to Great Britain.

Gerard says, "I have seen these trees growing in Cheshire, Staffordshire and Lancashire, where they grew in great plentie, as it is reported, before Noah's floud." It would be rather difficult to prove that statement of the old herbalist, but the finding great trunks of this tree in peat bogs both in England and Ireland, goes far to prove that it is indigenous to both countries. In the Highlands of Scotland this tree is to be seen in perfection. Sir T. D. Lauder thus graphically describes the romantic beauty of these fir-woods : "At one time we find ourselves wandering along some natural level under the deep and sublime

shade of the heavy pine foliage, upheld high overhead by the tall and massive columnar stems, which appear to form an endless colonnade, the ground dry as a floor beneath our footsteps, the very sound of which is muffled by the thick deposition of decayed pines with which seasons of more than one century have strewed it, hardly conscious that the sun is up, save from the fragrant resinous odour which its influence is exhaling and the continued hum of the clouds of insects that are dancing in its beams over the tops of the trees. Anon the ground begins to swell into hillocks, and here and there the continuity of shade is broken by a broad rush of light streaming down through some vacant space and brightly illuminating a single tree of huge dimensions and of grand form which stands out in bold relief from the darker masses behind it, where the shadows again sink deep and fathomless among the red and grey stems, whilst nature, luxuriating in the light that gladdens the little glade, pours forth her richest Highland treasures of purple heath-bells and bright green bilberries, and trailing whortleberries, with tufts of ferns and tall junipers irregularly intermingled."

The timber of the Scotch fir, which is known



SCOTCH FIR BLOSSOM AND REDSTART.

as red deal, is universally used for house-building, its lasting qualities being nearly equal to that of the oak.

The roofs of old buildings made of this wood have been found, after the lapse of centuries, in perfectly sound condition.

The pine stems imported from the Baltic form the tall straight masts required for the Navy.

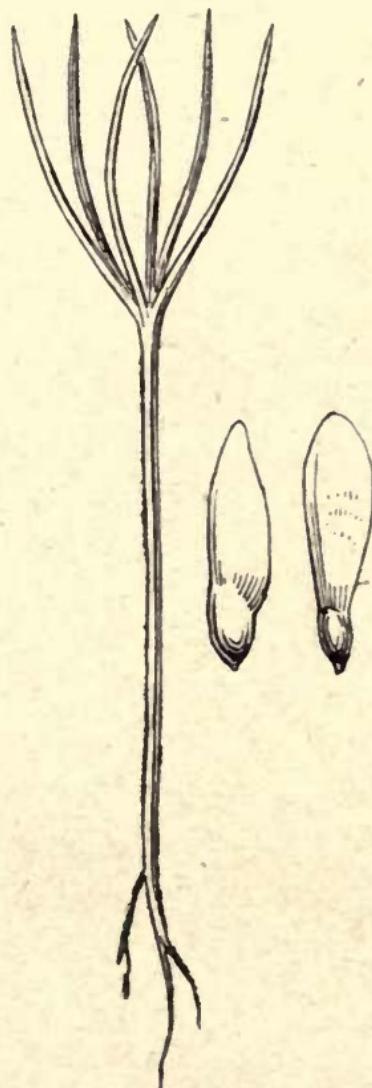
In aged specimens of the Scotch firs the bark becomes peculiarly rugged, so cracked and seamed that it lies upon the trunk of the tree in large irregular masses, from which thin flakes are continually becoming detached and strewing the ground beneath with morsels of bark. These flakes are often of a most fantastic outline, and bear a remarkable resemblance to the conventional tree-stems we see in Chinese embroidery. The coincidence is curious, and as the tree grows abundantly in China, I imagine such designs may possibly have been suggested by this tree.

Reference to the drawing will show the male blossoms which cover every branch in the month of June. Yellow pollen, of which I have already spoken, is produced from them in vast quantities, and each grain, being provided with two small bladders, is admirably fitted to float in the air,

to be carried by the wind and thus to be brought in contact with the immature cone. The pollen grains remain adhering to the female flower for twelve months, there slowly developing and creating the small green cones that we see in the following spring. These continue to grow and harden, and by the third year they contain the winged and perfected seeds.

Seedling firs possess six or seven seed-leaves, and as these increase in size a bud is formed in the centre from which the true leaves will ultimately arise.

I often wonder why I so seldom find a seedling fir, but I imagine our numerous squirrels hunt eagerly after the ripening cones, and so but few seeds have a chance of germinating.



FIR COTYLEDON AND SEEDS.

THE WELLINGTONIA *(Sequoia gigantea.)*

A WELL-GROWN specimen of the Wellingtonia, one of the largest species of tree in the world, stands on my lawn, and being a youthful scion of a giant tree, it has given rise to many conjectures as to its age.

This question has lately been solved by my arriving at the fact that the Wellingtonia was only introduced into England by Mr. Wm. Lobb in 1853, and thus, even if my tree was one of the specimens earliest planted, it has only had fifty-one years in which to produce its solid trunk, now forty-three feet in height. The base is of bulky size, showing that preparation is made in early years for the weight it will have eventually to support.

Thus at the ground level it measures exactly eleven feet ten inches in girth, whilst three feet



A WELLINGTONIA IN THE STANISLAUS GROVE.

(The hollow base was used for years as a hunter's cabin.)

higher the girth is reduced to seven feet ten inches.¹ It is difficult to convey to my readers any definite impression of the amazing height of the Sequoia of the Sierra Nevada valleys.

Two of the largest of these trees have been destroyed; they are said to have been four hundred feet high. Now if we remember that the Monument in London is only two hundred and two feet, and that St. Paul's Cathedral, from its base to the top of the cross, is four hundred and two feet, we may in some measure grasp an idea of the colossal altitude attained by these prehistoric trees.

There are still remaining many grand specimens in the Calaveras and other groves, ranging from two to three hundred and sixty feet in height, but it is grievous to learn that these noble trees are being ruthlessly felled for timber. Unless some check is put to the devastation of the lumbermen, they must in a short time become extinct.

The *Sequoia gigantea* is only to be found in small "groves" scattered along the western slope

¹ I have some notes of another specimen of Wellingtonia planted in 1861 in better soil and in a more sunny situation. This tree has now attained a girth of thirteen feet near the ground, and is in height about sixty feet. It grows in an open field, and its branches, resting upon the ground, cover an area of ninety feet.

of the Sierra Nevada mountains. Of the larger trees only about five hundred specimens now remain.

Many years ago the bark of one of these great trees was stripped off for about one-third of its height (130 feet), cut into sections which were so numbered and arranged that they were able to be brought to England and rebuilt in the form of a hollow tree. This was placed in the tropical portion of the Crystal Palace, where it reached up to the glass roof. I well remember seeing it there and marvelling at its amazing size. These bark sections were two feet thick and enclosed sufficient space to accommodate fifteen persons who could be comfortably seated inside the tree.

At San Francisco a piano was placed and a ball given to more than twenty persons on the stump of a Wellingtonia which had been brought thither.

It seems a grievous pity that when, in 1866, the tropical portion of the Sydenham Palace was destroyed by fire, this relic of the great tree should have perished.

I will quote some interesting particulars about these huge trees from a pamphlet issued by the United States Department of Agriculture. Mr. Muir says, "Their great size is hidden from the

inexperienced observer as long as they are seen at a distance in one harmonious view. When, however, you approach them and walk round them, you begin to wonder at their colossal size, and seek a measuring rod. These giants bulge considerably at the base, but not more than is required for beauty and safety; and the only reason that this bulging seems in some cases excessive is that only a comparatively small section of the shaft is seen at once in near views.

"One that I measured in the King's River Forest was twenty-five feet in diameter at the ground and ten feet in diameter two hundred feet above the ground, showing that the taper of the trunk as a whole is charmingly fine. When you stand back far enough to see the massive columns from the swelling instep to the lofty summit, dissolving in a dome of verdure, you rejoice in the unrivalled display of combined grandeur and beauty.

"About one hundred feet or more of the trunk is usually branchless, but its massive simplicity is relieved by the bark furrows which, instead of making an irregular network, run evenly parallel like the fluting of an architectural column, and to some extent by tufts of slender sprays that wave lightly in the wind and cast flecks of shade,



HUNTER'S CABIN IN WELLINGTONIA.

seeming to have been pinned on here and there for the sake of beauty only."

The wood of this tree when first cut is white, but it soon turns to a dark mahogany colour.

The cone, for a tree of such amazing size, is remarkably small, not even so large as that of the Scotch fir. An inch in width, and an inch and a half in length is about its usual dimension. Each cone is said to contain from two to three hundred seeds, and, on a single branch of only two inches diameter, four hundred and eighty cones have been counted. The tree is monoecious, and bears its male flowers terminally. Like the cones, they are extremely small and inconspicuous ; in fact, I have not been able to examine either blossom on my own tree, although I know it must have flowered on some of the higher branches, as I occasionally find a cone lying beneath the tree in autumn.

When imported into other countries, Wellingtonias contrive to live and grow, but they do not seem to flourish in any climate but their own.

English botanists named the *Sequoia* "Wellingtonia" after our own great General, but in the United States it is known as *Sequoia washingtonia*.

There is a marked difference in the mode of



FOLIAGE AND CONES OF WELLINGTONIA (*SEQUOIA*) GIGANTEA.

Natural size.)

growth of a young Wellingtonia and an aged specimen, as may be observed in the drawings.

The photograph of one of my own trees shows that the branches rest upon the ground, and the whole outline from the base to the apex is that of a cone. This is its mode of growth when so placed as to have plenty of space, air and light on all sides, but if the tree is growing in a wood where light only reaches it from above, and space and air are limited, then, as is the case with other trees, the lower branches are starved ; they become feeble, and die off, leaving a bare stem of a height greater or less according to the age and size of the surrounding trees.

In a small wood of spruce firs adjoining this garden, the effect of overcrowding is strikingly evident. The slender stems rise without a branch for seventy or eighty feet, crowned by a very small head of greenery at the top. In a high wind these feeble trees sway to and fro like so many hop-poles, and if it were not for the protection afforded by the belt of sturdy oaks and Scotch firs which surrounds this place, some winter's storm would have long ago levelled them with the ground.



J. Leversuch.

YOUNG WELLINGTONIA AT THE GROVE, STANMORE.

THE HORSE-CHESTNUT (*Aesculus hippocastanum.*)

"Children played beneath it, lovers sat and talked,
Solitary strollers looked up as they walked.
Oh, so fresh its branches, and its old trunk gray
Was so stately rooted, who forbode decay ?
Even when winds had blown it yellow, almost bare,
Softly dropped its chestnuts through the misty air ;
Still its few leaves rustled with a faint delight,
And their tender colours charmed the sense of sight."

DORA GREENWELL.

THIS handsome tree appears to have been introduced into England, probably from Northern India, about the middle of the sixteenth century.

Many of our native trees have such inconspicuous catkin flowers, and produce them at such a height from the ground, that they may well be passed by unobserved, but the striking beauty of a horse-chestnut in full flower must appeal to the most unobservant eye.

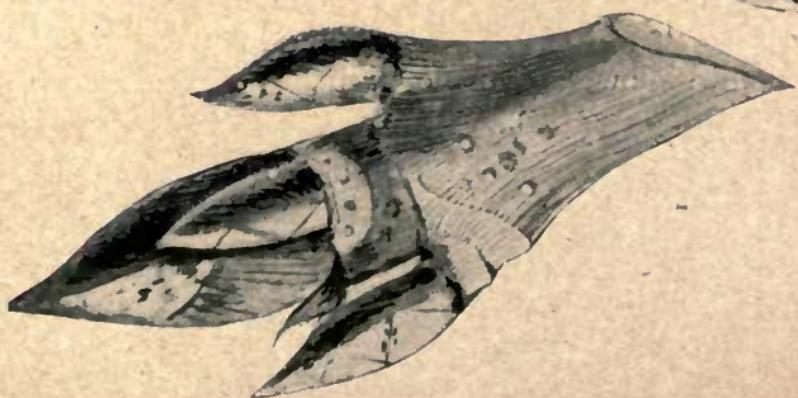
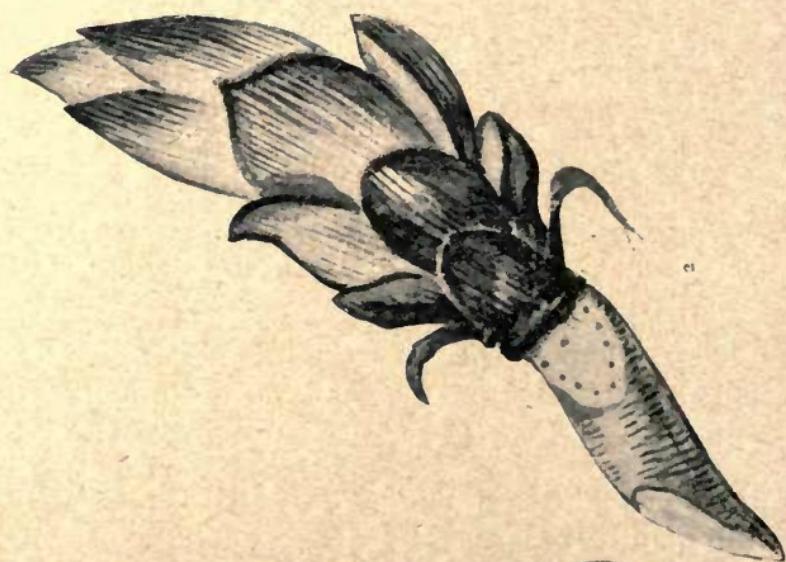
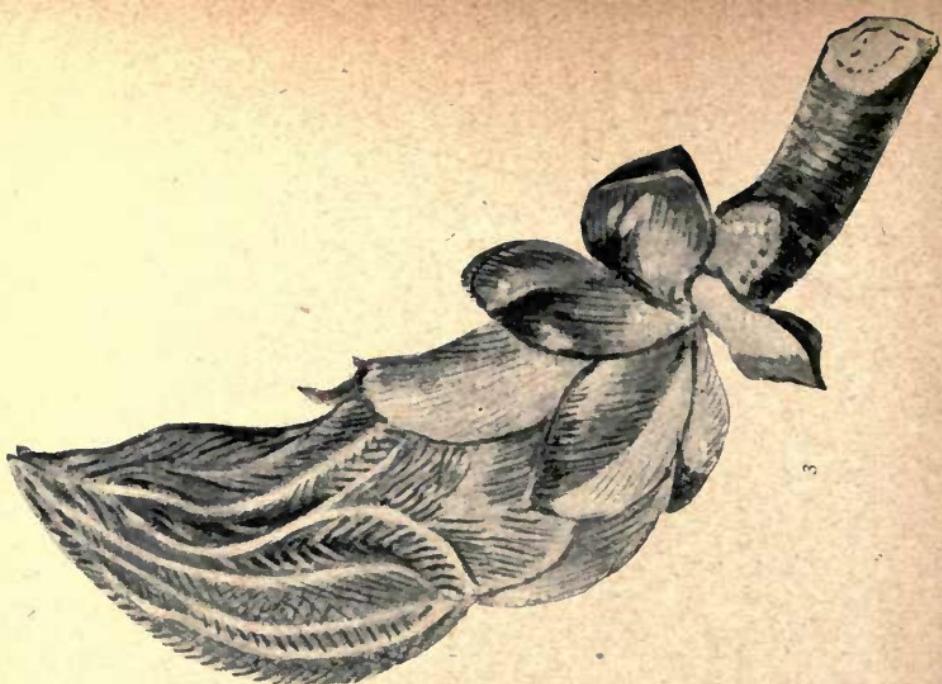
Gerard mentions it as a rare foreign tree in 1579, and Evelyn remarks with reference to it in 1663, "I wish we did more universally propagate the horse-chestnut, which being easily increased from layers grows into a goodly standard and bears a most glorious flower even in our cold country." How he would have admired the magnificent avenue of chestnuts in Bushey Park if he could have seen them in their full beauty of rich foliage and masses of silvery blossoms !

I believe it was the unfolding of the conspicuous buds of the horse-chestnut that first led me to take a special interest in our English forest trees, and in the hope that my readers may share in that interest I have drawn four studies of these buds to show their mode of unfolding in early spring.

The leafage of the tree is securely packed in each bud and defended from the effects of frost and snow by no fewer than fourteen scales, cemented together by a resinous substance which effectually shelters the immature leaves. With care it is possible to unpack one of these buds in winter, and by the help of a magnifying glass the minute leaves can be seen surrounding a little spike of flowers embedded in a substance which resembles soft yellow wool.

No severity of cold seems able to penetrate these

HORSE-CHESTNUT BUDS IN THREE STAGES OF GROWTH.



buds. They yield only to the increasing warmth of the sun in spring, which gradually melts the outer resinous coating and permits the scales to unfold and drop off, thus releasing the leaves, which, in all the beauty of their tender green, hang droopingly for a while, until they gain strength to



HORSE-CHESTNUT BUDS IN FOURTH STAGE OF GROWTH.

expand their five or seven leaflets. It is at this time that our numerous squirrels hold high revels amongst the branches, biting off the young shoots of tender leafage, apparently in sheer mischief, until the ground beneath is strewn with a *débris* of leaves and flower-buds.

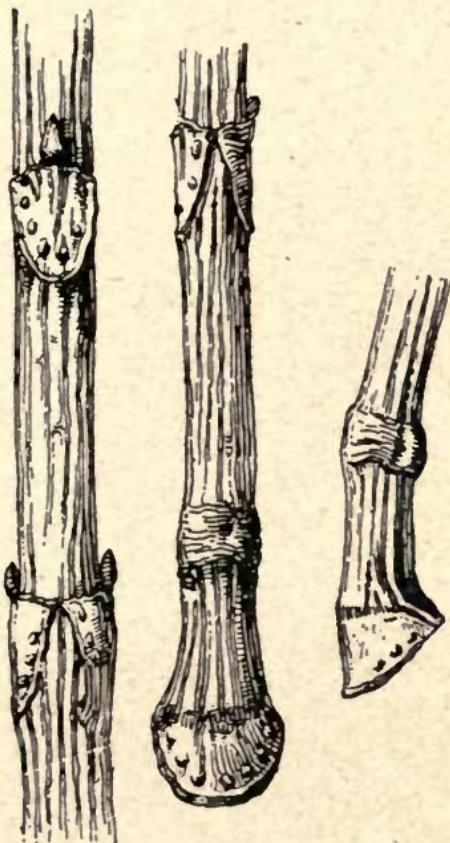
This annual pruning only lasts for a day or two, and I must say I can never trace any ill-effect from it ; doubtless nature supplies fresh shoots to fill the place of those that have been destroyed.

There are many derivations of the name of this tree ; I can but suggest one or two that seem most likely to be correct. As the word "horse" is a common prefix denoting anything large or coarse, such as horse-radish, horse-mushroom, it may have been applied to this tree because it grows vigorously and has large expanding leaves. I am, however, inclined to believe that it is more likely that the name has arisen from the leaf-scars so closely resembling a horse's shoe. Also amongst the smaller twigs may be found some which are almost exact counterparts of a horse's foot, fetlock, and leg. According to the angle at which they grow will depend their resemblance to a fore or to a hind leg.

The glossy-brown nuts which strew the ground in autumn do not appear to be of much value. Starch has been made from them, but the process was found to be too costly to be remunerative. Neither are they attractive to any animals except deer, which greedily devour horse-chestnuts. For their sake I allow the nuts to be collected when desired by those who possess a deer park.

In Switzerland, I believe, these nuts are crushed and used as food for fattening sheep.

The horse-chestnut is one of the first trees to



HORSE-SHOE MARKS ON CHESTNUT TWIGS.

show the yellow tints of autumn, but it is beautiful in its decay, and hardly can I recall a more vivid effect of colouring than may be seen when looking

up at a deep blue sky through golden-leaved chestnut boughs.

In some cases a branch here and there will turn a rich crimson, which greatly increases the gorgeous effect.

The forms which the adult tree takes are often eccentric. Five and twenty years ago there was a horse-chestnut in the grounds of Ardblaccan Castle, County Meath, which covered nearly a quarter of an acre, its peculiarity being that it imitated the banyan tree, the branches falling and taking root again. I do not know whether this remarkable specimen still survives.

The separate leaflets, when dry and sear, will often curl into a peculiarly graceful form, and after remarking this fact for many years I was much interested to see, at an exhibition of carved wood-work at South Kensington, that one of the students had produced an exquisite panel, the ornamental scheme of which was entirely borrowed from these curled leaflets. An artistic eye had noted their special beauty and used them with admirable effect in an elaborate design in carved lime-wood.

The timber of the horse-chestnut is soft, and unfit for use where strength and durability in the open air are required. It is, however, said to



HORSE-CHESTNUT.

[J. Leversuch.]

be useful for underground water-pipes, and the boards are suitable for flooring and packing-cases.

It is worth while to observe the curious way in which the bark splits off in a series of curves, so that the fragments beneath the tree are of a rounded form, whilst the sycamore has an exactly opposite habit; its bark splits vertically and horizontally, shedding small pieces which are often absolutely square.

I am glad to observe that the red-flowered chestnut (*Pavia rubra*), which is an allied species, is more frequently planted than it used to be; its flowers are scarcely as large and vigorous as those of the common horse-chestnut, but their vivid colour combines admirably with masses of lilac, laburnum, hawthorn, and other flowering shrubs.

Our specimen of *Pavia macrostachya* is always one of my "spring delights." Its early shoots are of a fine reddish brown hue, opening into leaves of elegant form, and then, six weeks later than the common chestnut, it produces its curious flowers. They are white, with long projecting stamens which give a delicate fringed effect to the spike of blossom.

THE CEDAR OF LEBANON

(*Cedrus Libani.*)

"The trees of the Lord are full of sap : the cedars of Lebanon which He hath planted."—Psa. civ. 16.

THE two ancient cedars I am proud to possess cannot, like my Scotch fir, be seen from the windows of the house, for they stand in the park at some little distance from the garden. A good view, however, of their grand proportions can be obtained from a mound, twenty-four feet high, which is sufficiently near to the trees to enable us to look down upon the great horizontal branches in a way that is not always possible.

The origin of this mound or "Cedar View," as we call it, has been a subject of much speculation. It is certainly ancient, and an antiquarian friend of mine suggested that it was a Saxon barrow, possibly containing interesting remains of a far-

away time. In the light of this conjecture it was a curious coincidence that, whilst he and I were discussing this subject and examining the old mound, I happened to pick up on the spot a British hammer, that is to say, a flint stone chipped by human means in a special way, and much abraded at one end by having been used for pounding corn in the days before iron implements had been invented. This seemed to confirm the idea that the mound had a history, so, when severe weather set in, and men were wanting work, I resolved to make an opening into it to try and find the hidden remains if any existed. Accordingly tunnels were bored both vertically and horizontally, but, alas! as we only found roots of water-plants amongst the clay, we came to the conclusion that the hill was formed of the earth dug out of a deep pond near by, and so our Anglo-Saxon theory came to nothing.

Still the Cedar View has its interest, and is very picturesque, as may be seen from the sketch, showing its pleached yew-hedges, its ancient moss-grown lions, and the statue of Dick Whittington, which forms the centre of a gravelled space at the top of it. Trees of great size grow on and around the Cedar View, showing it has existed for at least a century of years. A sycamore, seven feet



THE CEDAR VIEW.

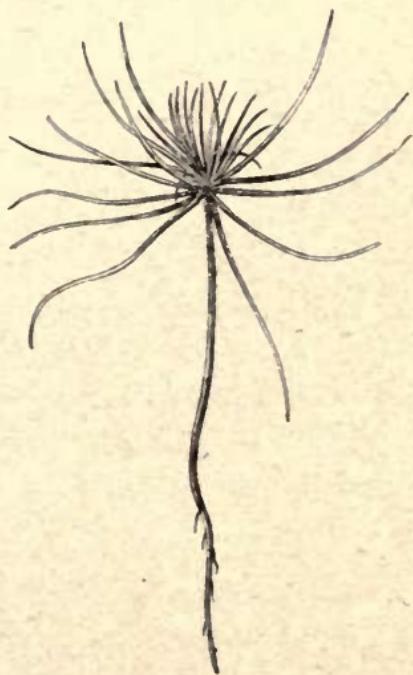
in girth, overshadows the little figure of Whittington, who looks plaintively around as if listening for the fateful bells. Two huge hollies stand near by, with tall slender stems drawn up by their position amongst other trees till they have attained the height of forty-five feet, with a girth of four feet nine inches.

This Cedar View is a delightful place on a summer's day. Sheltered from the sun, with a cool refreshing breeze from the wide stretch of open country which lies eastward, we look through and above the cedars across the park, which slopes down to the rush-fringed lakes, catching a glimpse of the Elstree Reservoir, then over wooded country to far blue distances, with the grey pile of St. Alban's Abbey on the horizon.

The cedars this year are thickly covered with their light green cones, formed twelve months ago, and needing another year or more to come to maturity. When quite ripe, they never fall off like fir-cones, but the scales become loosened, and then the first high wind detaches them. In this manner the winged seeds are released and carried far and wide.

It is thought that my cedars are about a hundred and forty years old. The trunk of the largest one measures sixteen feet in girth, and

standing beneath it, and looking up at the massive branches, one is filled with reverent wonder at the growth of such a tree. Springing as it did from a tiny seed, which simply fed upon the soil and drank in the rain of heaven, in a hundred



SEEDLING CEDAR.

years to what a majestic growth has it attained ! Such is the expansive power of vegetable life.

I believe the exact date of the introduction of the cedar into England is not known. Many very ancient trees of magnificent growth exist in various parks throughout our country, but they

sink into insignificance when compared with those still growing on Mount Lebanon. The girth of the largest there is more than forty-one feet, the height about a hundred feet. As to the age of these specimens, estimates differ. Some travellers aver that they have probably been growing ever since the Flood, others seem to have good ground for believing that the older specimens must be over three thousand years old.

Cedars still growing in the Chelsea garden first produced cones in 1766; the seed proved fertile, and from that time the tree has been extensively planted in England, and adds dignity to many an ancient garden throughout our land.

The peculiar horizontal growth of the cedar of Lebanon is admirably described by Dr. Thomson.¹ "The branches are thrown out horizontally from the parent trunk. These again part into limbs, which preserve the same horizontal direction, and so on down to the minutest twigs, and even the arrangement of the clustered leaves has the same general tendency. Climb into one, and you are delighted with a succession of verdant floors spread around the trunk, and gradually narrowing as you ascend. The beautiful cones seem to stand upon, or rise out of, this green flooring."

¹ "The Land and the Book," by W. M. Thomson, D.D.

This level method of growth renders the cedar liable to continual injury in severe winters. The



THE CEDAR OF LEBANON.

(Very greatly reduced.)

softly falling snow piles up upon the branches and lays such a burden upon them that at last the strain is too great, and they break off one

after another until the symmetrical beauty of the tree is ruined.

During the severe gales of March, 1899, a huge branch was broken off one of the cedars, and when examining the mutilated tree we found that this particular branch must have been slightly wrenched from the trunk some years before, although the injury was not visible to any one standing beneath the tree. Slight as the severance was, it allowed rain-water to collect in the cavity amongst the splintered wood. The presence of this moisture inside the tree stimulated the formation of aerial roots, and these roots, in large quantities, were revealed when the limb was torn from the trunk. From the position of the long matted roots, it was seen how wonderfully they had helped to hold the ponderous branch in its almost horizontal position, and also how they had served to supply water to the injured branch, by absorbing the rain deposit, which, if left in the injured wood, would have caused decay.

The female blossom, which results in the cone, is only produced at intervals of a few years, but the male pollen-bearing catkin usually appears in considerable quantities every year in late autumn.

It is not often possible to find the very young cones within reach, as they are apt to be produced

[J. Loversuch.

EFFECT OF A MARCH GALE.

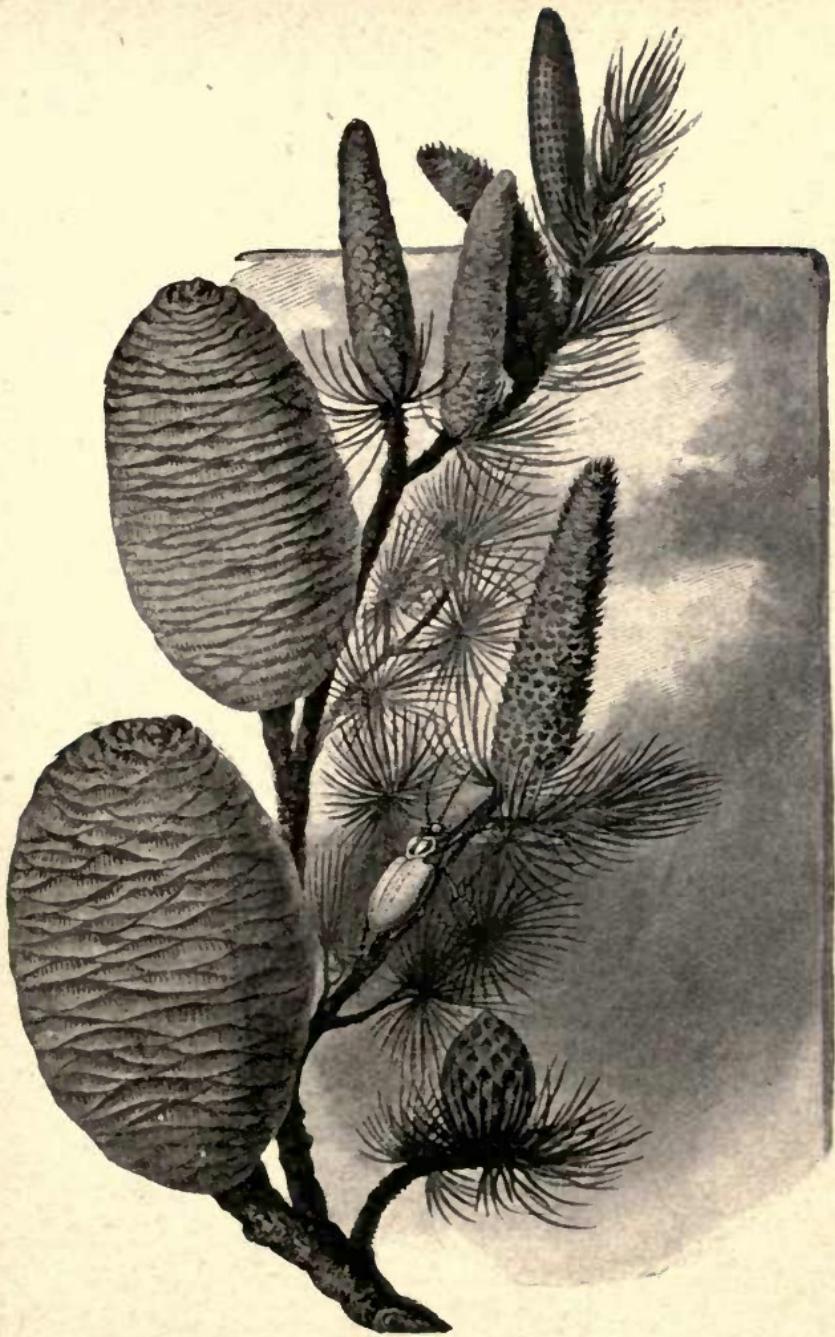


more freely on the upper and inaccessible branches. I therefore had to wait fifteen years before I could obtain a specimen from which to complete my drawing of cedar flowers.

The beetle which appears in the sketch is the beautiful *Calosoma sycophanta*, which, although rarely found in England, abounds on the Continent to such an extent that at night the fir-woods, when explored with a lantern, are found to be swarming with these beetles pursuing their beneficent work, destroying other insects which prey upon the fir-tree. The Rev. J. G. Wood says,¹ "It is impossible to calculate the benefits which this beautiful insect confers upon the countries in which it lives, and it is not too much to say that but for the *Calosoma* the fir-tree would be extinct in many of those places from which we derive our chief stores of timber. Both in the perfect and larval condition this beetle is carnivorous, feeding upon the destructive caterpillars of the processionary and gipsy moths and also upon the pine saw-fly, the creatures which do most harm to the forest."

I possess a specimen of the *Calosoma*, and truly it is "a thing of beauty," of a rich golden green shot with iridescent gleams of other colours as

¹ "Insects at Home," p. 37.



CEDAR SPRAY WITH *CALOSOMA SYCOPHANTA*

one holds it in different lights. The first recorded British specimen was captured at Aldborough by Crabbe, the poet. I may mention that the cedar-wood used for pencils is obtained from *Juniperus virginiana*, an American tree which yields a soft, agreeably scented wood, not only suitable for pencils, but much in request for small cabinets, boxes, matches, and other purposes.

Pliny makes mention of the imperishable nature of cedar-wood. A temple of Apollo at Utica, in Northern Africa, being built of it, was found to be perfectly sound after two thousand years.

When we read in Scripture that King Solomon employed eighty thousand "hewers in the mountains," we can picture to some extent the busy scene as the huge cedars were felled and brought down from Lebanon, then formed into rafts and floated by sea to the landing-place, where the Sidonians would hew and fashion them into material for the building of the temple (1 Kings v. 6).

Many years ago there was an exhibition of a most interesting nature at the Egyptian Hall. It consisted of the articles found during excavations in underground Jerusalem at a depth of eighty feet, where Solomon's temple originally stood. Of all the remarkable things exhibited, I think I was most impressed at seeing some of the beautifully

carved cedar-work of the Temple, portions of it quite perfect, and other pieces of it blackened and charred by the fire which destroyed that marvellous building.

It would be an interesting exercise for young students to gather all the Scripture references to the cedar of Lebanon, and observe how it was used as an emblem of growth (*Psa. xcii. 12*), of power and strength (*Job xl. 17*), of sweetness (*Hosea xiv. 7*, Lebanon being a synonym for cedar), of stability (*Hosea xiv. 5*), and, combined with hyssop, the wood was used in offerings for purification (*Lev. xiv. 4*).

The delicious balsamic odour of cedar-groves and pine-woods arises from an essential oil which permeates the leaves and timber, and exhales under the warmth of summer sunshine. This oil is said to have been used in ancient times to smear over the leaves of papyrus to prevent their destruction by insects, just as we still put cedar shavings amongst our furs to repel the destructive moths. Much more might be said about "these trees of the Lord," but space will not permit. Let us ever regard them with reverence, not only for their own intrinsic grandeur and beauty, but because they are linked in so many aspects with Bible teachings.

THE LARCH

(*Larix europaea.*)

"When rosy plumelets tuft the larch."—TENNYSON.

A TENDER veil of green beginning to appear upon our favourite larch-tree is one of the earliest tokens of the coming spring. The tree stands on rising ground in full view of our windows, so that we can watch its re-leaving and the gradual deepening of tint from the pale cold green of early spring through all its rich summer beauty until the fawn colour of autumn tells us that it will soon be shorn of its soft foliage by the wintry gales.

Writers appear to differ in their estimate of the beauty of this tree.

Wordsworth has no good word to say for it, and condemns it as lacking in dignity, in colour and in the power of affording shade. Other poets seem to dislike the crudity of its early tints, but, in the



[F. Leversuch

THE LARCH IN WINTER.

infinite variety we see in the woods, surely the charm arises from the blending of many shades of the same colour into an harmonious whole.

Usually the larch has a single central stem from which the branches depend on all sides, but our tree is an exception to the general rule, for, at four feet from the ground, it divides, and the two tall stems rise to an equal height and size. They are chained together near the top lest in some severe gale they might be split asunder, and the tree would then become a wreck.

The larch was introduced into England from the Continent in 1629.

About the beginning of the last century the then Duke of Atholl planted thousands of acres of mountain land with young larch-trees, which have now become forests of timber valuable for shipbuilding. Being a tree that will grow rapidly on almost any soil, and even at an elevation of eighteen hundred feet above the sea, the larch is naturally selected as one of the most suitable for clothing barren hills with verdure. In the course of fifty years the plantations attain the height of fifty feet or upwards.

My own specimen is, we think, about seventy-five feet high, and at five feet from the ground it measures sixteen feet round the stem. Like so

many of the trees in this place its lower branches rest upon the ground, showing how undisturbed its growth has been from its early youth. It is curious to trace the course of its huge knotted roots, which spread themselves across a gravel path and then along the surface of the lawn, indicating the way in which, in order to resist the force of our wintry storms, the tree has firmly anchored itself in the ground.

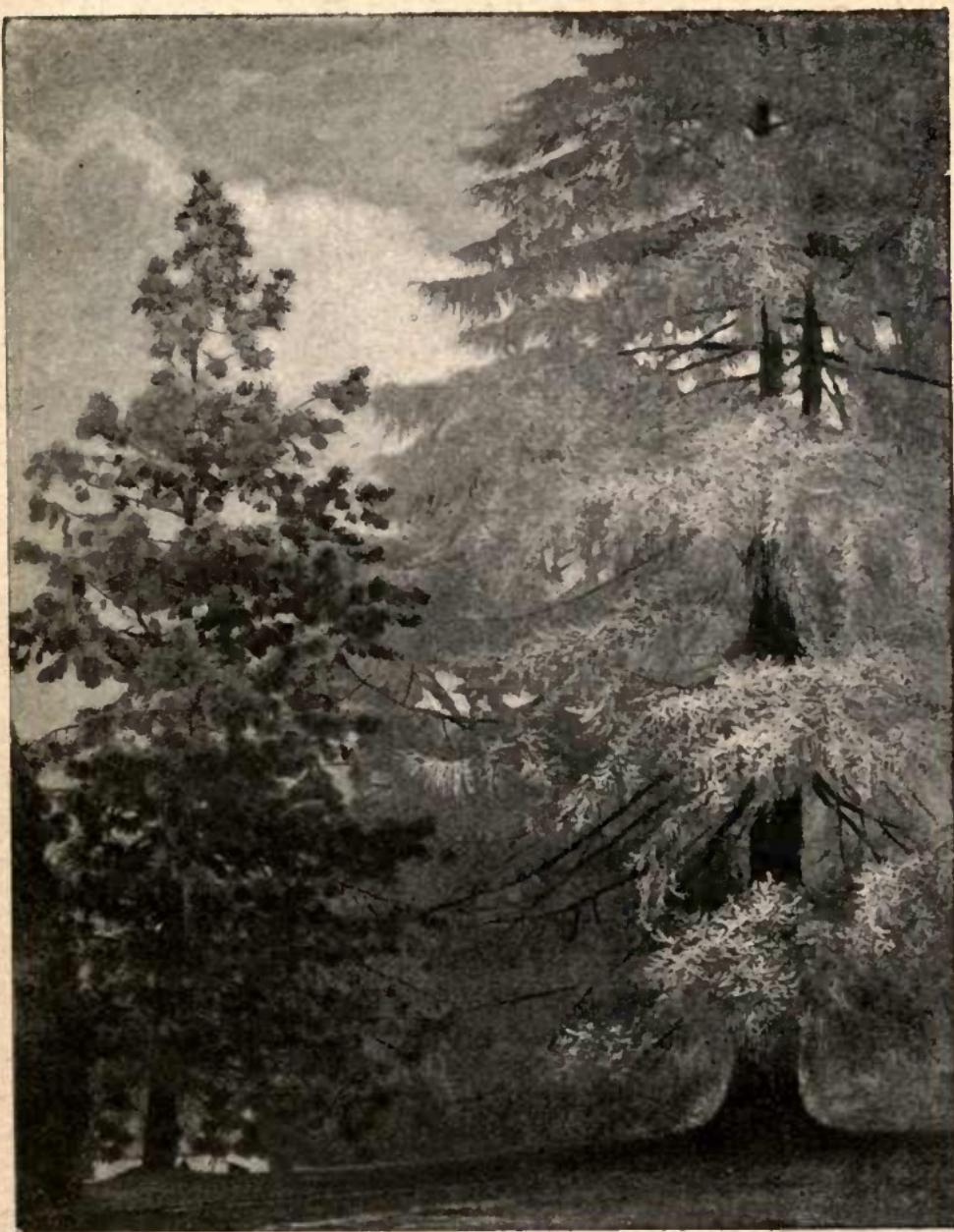
Larch bark is used in Switzerland for tanning leather, and the leaves and young shoots afford food for cattle. It is a useful tree in other ways, as its sap yields Venice turpentine, much in demand by painters for making varnish. Early in the year an incision is made in the trunk about three feet from the ground, and into this a trough is fixed so that the sap runs into a tub placed below. The turpentine is clear at first, but it thickens after a time and becomes of a citron colour; it possesses the useful quality of not becoming hard by exposure to the air, at any rate not for a considerable time. I have often observed a white exudation on the leaves of my larch, and I feared it might prove to be a parasitic fungus of some destructive kind, but I have now discovered that it is the nature of the tree to throw out a sweet sugary substance which in former days used

to be collected from the larch forests at Briançon in Dauphiny, and sold under the name of Briançon manna ; this was supposed to have some medicinal value.

The late Mr. Daniel Hanbury paid a visit to Briançon in 1857 to inquire into the production of this special manna. After considerable search he speaks of finding "here and there upon the foliage of the trees a little tear of white sugary matter encrusting the needle-like leaves." A peasant informed him that the manna was only found in the cool of the morning, and that the season for it was then almost over.¹ "Subsequently to this, however, M. Berthelot chemically examined this exudation, and found it to contain a peculiar variety of sugar which he designated *Melezitose*, a word derived from *mélèze*, the French name for larch."

The larch ripens its seeds freely in Great Britain, and is raised by Scotch nurserymen in larger numbers than any other forest tree. The timber is compact, is reddish brown in colour, and takes a beautiful polish so as to become almost translucent. It has the excellent property of hardening with age ; this is perhaps the reason why old painters used it more than any other

¹ "Science Papers," by Daniel Hanbury, F.R.S.



HOARFROST ON LARCH.

J. Leversuch.

wood to paint on before the use of canvas became general. Many of Raphael's pictures are painted on boards of larch.

The wood is much in request for shipbuilding, railway sleepers, and house carpentry ; it catches fire with difficulty and does not splinter even when struck by a cannon-ball.

The month of April brings amongst other signs of spring the exquisite blossom of the larch sprays. The small crimson waxy cones appear before the tender leafage, and are fertilised by the yellow pollen-bearing catkins. A few weeks later the cones, half hidden by the leaves, have faded to a pale pink colour ; they continue to increase in size, and in a year's time they will be found to be hard and brown, and to have shed out their small winged seeds upon the ground.

I often see a little flock of golden-crested wrens flitting in and out amongst the larch branches, feeding on minute insects. These agile little birds hang head downwards or side-ways, peering into every tuft of foliage, keeping up all the while a musical twittering to each other, till one flies off to another tree, when all the rest obediently follow and renew their search for insect prey.

This smallest of our English birds stays with us through the coldest winter, and is amongst the



LARCH BLOSSOM AND WREN.

earliest nest-builders, for the call-note of the male bird may be heard in February, and young birds have been seen fully fledged in April.

I will conclude with a curious fact about the larch leaves which I find recorded in the "Treasury of Botany." "Round some of the meres or lakes in Shropshire the larch is abundantly planted. Its leaves fall into the water, and become felted together into large ball-like masses by the agency of a peculiar species of conferva. These larch balls may be met with of all sizes, from that of a marble to that of a child's head ; they lie at the bottom of the lake and are washed up round its margins."

THE BIRCH¹

(*Betula alba.*)

"I find myself beneath a weeping birch, most beautiful of forest trees, the Lady of the Woods."—COLERIDGE.

A BOUT five and twenty years ago our Stanmore Common was thickly overgrown with gorse, and each spring it was one of my special pleasures to watch the golden sheen of the furze blossoms spreading over more than two hundred acres of undulating ground.

Here and there, through stretches of woodland, the rich colour melted away into blue distances with exquisite effect. Then was the time to enjoy what Coleridge describes as "the fruitlike perfume of the golden furze." A passing breeze would

¹. Loudon derives the name from the Latin word *batuere*, to beat; from the fasces of the Roman lictors which were always made of birch rods, being used to drive back the people.

bring those exquisite wafts of scent which seem to be the very breath of nature, health-giving and life-inspiring.

It was very difficult to leave such an enchanting spot, and many a happy ramble have I enjoyed on our common as it used to be, but alas! all is now entirely changed. Year after year fires broke out, and large portions of the common were laid waste by them. Nevertheless the gorse would revive and spring up again, until at length a fiercer fire than usual consumed even the roots of the furze beyond recovery.

After a few years the dreary waste began to be covered by low green bushes, which we discovered to be young birch-trees, springing up in countless numbers.

It will always remain a mystery how the seed was sown; it can only be conjectured that a high wind must have swept over some birch-trees in the adjacent Priory woods just when the seed was ripe, and conveyed and distributed it over the common.

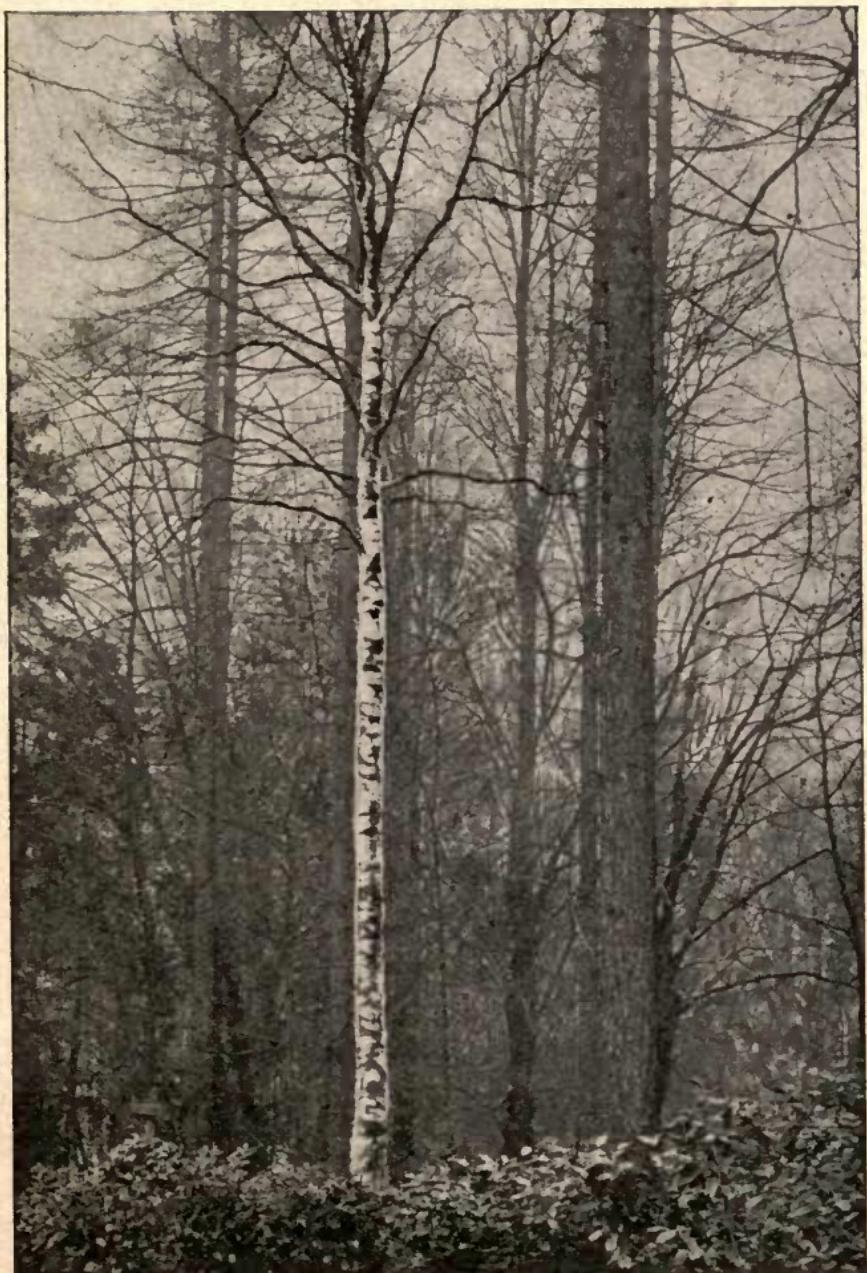
Thus in the course of five and twenty years we have exchanged our sweep of furze for clustering birch woods, and although there is no denying the delicate beauty of the young plantations, especially in their early spring foliage, still I shall



WEEPING BIRCH AND YEW-TREE SEAT.

always long to enjoy again the rich colour and perfume of our former surroundings.

About thirty years ago we planted on our bowling green a weeping birch to overshadow a quaint old yew-tree, clipped after the fashion of olden days into the shape of an arm-chair. Resting in this rural seat, one can enjoy, to the north, a wide-stretching view which ranges over several counties, with St. Alban's Abbey clearly visible upon the distant horizon. The delicate birch sprays, supported by a slight iron framework, form a perfect canopy sheltering one from the sun's rays and yet allowing refreshing breezes to pass through them. In strong contrast to this tree is a slender birch near my entrance-lodge, which answers somewhat to the poet's epithet of the "lady of the woods." In some forty years it has been drawn up to a height of about seventy feet while retaining a girth of not more than four feet six inches at three feet from the ground. Situated as it is amongst surrounding trees, it has been compelled to reach upwards to obtain all possible light and air; hence the slender girth of its attenuated stem, whilst the grafted weeping birch which shades the yew-tree seat, having abundant light and space, has thrown its energies into wide-spreading branches, and in thirty years



[F. Leversuch.]

BIRCH-TREE IN A WOOD.

has scarcely added more than three feet to its height.

I may here suggest that it much increases the interest of a country ramble to notice the influence of environment upon the mode of growth in trees.

When they are planted too closely together in a group, they are apt to become one-sided, whilst those in the open ground are symmetrical because the branches can expand on all sides, each receiving its due proportion of air and light.

Trees growing on an exposed sea-coast are often painfully crooked, all bent in one direction by the force of the prevailing winds.

Another point of interest is the clearly marked difference between trees in fields where cattle browse upon the foliage as high as they can reach, thus forming a clear space with only tree-trunks, and the far more beautiful effect where, in enclosed parks, the ancient trees can rest their uninjured branches upon the ground.

To the lover of nature these things are full of interest, since they reveal to intelligent eyes the influences which have created the kind of woodland or forest scenery we may be exploring.

The birch, although a native of Britain, is

essentially a northern tree, flourishing in the colder regions of Europe and Asia.

In Scotland it clothes the bleak mountain sides, and is found at an elevation of 3,500 feet.

In Italy it exists at even 6,000 feet above the sea, but it becomes smaller in proportion to the cold it has to bear and the altitude at which it grows, until it is dwarfed to the dimensions of a small green bush.

Birch-wood is white with tinges of red, and is considered to be of fairly lasting quality.

An old specimen of one of these trees was blown down here in a winter's gale, and, not being required for timber, the rather rugged stem was cut into short lengths, placed end-wise, and, combined with tree-roots and ivy, formed a quaint sort of fencing around an ancient well.

After some years I saw for myself what I had often been told about the durability of birch-bark.

The inside wood decayed and fell away, leaving the outer bark standing like a hollow cylinder which might have been filled with earth and used as a flower vase.

In Swedish Lapland the bark is cut into tiles for the house-roofs, and it is said that in times of scarcity the poor people grind the bark into a kind of flour to mix with their bread-corn.

Loudon, speaking of this tree, says, "The Highlanders of Scotland make everything of it; they build their houses, make their beds, chairs, tables, dishes and spoons, construct their mills, make their carts, ploughs, harrows, gates, and fences, and even manufacture ropes of it. The branches are employed as fuel in the distillation of whisky; the spray is used for smoking hams and herrings, for which last purpose it is preferred to every other kind of wood. The bark is used for tanning leather, and sometimes, when dried and twisted into a rope, instead of candles. The twigs are used for thatching houses, and, dried in summer with the leaves on, make a good bed where heath is scarce."

In Russia an oil is extracted from the birch which is used in the preparation of Russia leather. In England birch-woods are chiefly valuable as supplying material for sweeping brooms.

A curious feature of the birch is the nestlike structures so frequently to be seen upon these trees and also on the hornbeam. These are really huge bunches of abortive twigs, some quite dead others with a little life left. They are caused by the presence in the buds of numbers of a minute gall-insect known as *Eriophyes rufis*, which is allied to the troublesome little parasites the acari.



BIRCH-BARK WIGWAM AND CANOE.

These small creatures concentrate on some point, and by continually living upon the sap of the twig they destroy the buds and produce the masses of woody growth shown in the illustration, which are popularly known as witches' brooms. Some trees on this estate are infested to such a degree with these galls as to look, in the distance, like a rookery, whilst others are only slightly affected. The parasite does not appear to injure the tree to any great extent, as some of the most infected trees are quite robust.

I must not omit to mention the useful paper-birch from which the Canadians form their canoes.

The pieces of bark are stitched firmly together with deer's sinews, or with the fibrous roots of the white spruce, and the seams being coated with resin, they are rendered water-tight, and so portable are they that they are easily carried on men's shoulders from one lake to another.

A canoe which can hold four persons only weighs about forty or fifty pounds.

The bark can be divided into very thin layers, and these make an excellent substitute for paper. I possess a sheet of it as thin as ordinary note-paper, and as easy to write upon.

“A strip of pinky-silver skin
Peeled from the birchen-bark.”

We can easily distinguish the two kinds of catkins on the birch. The pistil-bearing flower is small and upright, whilst the male blossom hangs down and bears the pollen in its bracts. Towards the autumn we shall find that the small catkin, which in spring is erect, has become pendant and composed entirely of minute seeds, which autumnal gales will carry far and wide.

Evelyn discourses at great length upon the medical properties of the wine which used formerly to be made from the abundant sap of the birch-tree. It rises in the stem early in April, and it is said that from sixteen to eighteen gallons of it can be drawn from a single tree.

When boiled with honey, cloves, and lemon peel and afterwards fermented with yeast, this sap produced a beverage of great strength, which was credited with many virtues.

Space will not allow me to touch upon further uses of this tree, which is not only remarkable for its elegance, but also for its adaptation to many purposes in our daily life.

HOURS IN MY GARDEN

INMATES OF MY GARDEN

AS I watch the peaceful and yet highly amusing scenes which greet me from my window day by day, I am often tempted to describe them. The wild creatures in this place have been led to give me their society and confidence as the result of more than thirty years of persistent kindness and encouragement.

In the nature of things in this changing world it cannot often happen that so long a period can be secured wherein to carry out a settled purpose, and on this account my experiences may possess a certain interest for the general reader. The quietness of a large, well-wooded garden with fields and woods beyond, the avoidance of persecution, and abundance of food suited to the requirements of animals and birds—these have been the means used to attract my furred and feathered guests.

Generations of squirrels have grown up in the firm belief that the dining-room window is the place where nuts are always to be found, and there they troop, winter and summer, to delight us with their graceful frolics. When the weather will permit the windows to be open, we are entertained with glimpses into squirrel life, such as can seldom be obtained except in the tree-tops. From the window-sill our little guests leap on to a table where my cardinal-bird's cage stands. He is quite used to their springing up and stealing his juicy grape or piece of apple. He accepts the affront without so much as a flutter, for he knows his loss will be supplied ere long. If their nuts are all eaten, the little thieves will then run over the carpet to a corner cupboard where they well know a certain box filled with Barcelonas is to be found, and, without leave asked or given, they leap into it, and as they sit amongst the nuts, we hear them cracking the shells and flinging them about in reckless fashion.

One or two more hungry waifs arrive, and then there follows a battle royal. With angry growls there is probably a furious chase around the dining-table, and out go the combatants through the window, across the lawn and up the grey trunk of the tulip-tree, around which they dart with quite wonderful agility.

In the spruce fir, close to the window, all this time the grey nuthatches sit awaiting their share of the good things. When their turn comes they balance nut after nut in methodical fashion to make sure that they are of good quality; then away they go to the large oak-trees near by, whose rugged bark affords the crevices into which they ram the nuts firmly, so that, head downwards, they can hammer at the shells until they reach the contents. Meanwhile, the tit family have been feasting on fat of various kinds in their hanging-basket. We see four species—the greater tit, the blue tit, the cole tit, and the marsh tit, charming birds all of them, with their pert, fussy little ways and angry tempers. Can there be anything more fascinating than an irate blue tit? The feathered morsel sets up his little crest, opens his beak, outstretches his tiny wings, and, having made the most of himself, is prepared to defy a bird twice his own size. As a matter of fact, he does generally succeed in thus holding his own, by dint of bravery and sheer impudence combined.

Now we see, stealing quietly across the lawn, a troop of ten or more hen pheasants, meek, gentle creatures that were born in the spinney just beyond the carriage drive and have grown up into the traditions of this place.

They have learned that peace and happiness abide here, that October has no terrors for them, that no gun will ever be pointed at them ; and so they enjoy their lives in safety, and give me their gentle companionship all the winter and spring until family duties call them to the woods to make their nests and rear their downy broods. These broods will in turn be led here for me to see next winter. These pheasants are a constant delight to me, they are so graceful in their manners, and almost as tame as barn-door fowls.

Now there comes a lordly 'cock-pheasant, magnificent in bronze and gold plumage. It is delightful to watch his chivalrous behaviour to the ladies of his harem. If he finds a nice morsel of bread or cake, he calls and waits for them to come and enjoy it ; in fact, he has always the air of being quite above such a sublunary thing as food, or rather, as if he merely looked on with no special interest in the matter. This, however, is not the case in severe weather. Then the gorgeous creature is glad enough to share the sopped bread with his ladies.

A curious little scene was enacted between a group of pheasants and Merops, my tame rook, one frosty day this winter. All were alike hungry, and the rook, failing to get at the bread, delibe-

rately stalked up to a cock-pheasant and pulled his tail. Of course, the aggrieved bird whisked round with a sharp peck in return, but none the less kept guard over the bread. Again the rook tried vainly to edge himself in ; the birds kept in a sort of ring-fence and busily devoured the food. Merops then approached a hen-bird and seized her tail, with a better result, for she simply raised her head to consider in a dreamy sort of way what could have happened to her tail. This was Merops's chance ; away he went with the coveted piece of bread, which he had certainly earned by the exercise of his wits.

This charming flock of tame pheasants can be seen at intervals all through the day in winter and spring, pacing about upon the lawn, running swiftly (and pheasants can run) from one place to another, never seeming to disagree among themselves, giving life and interest to the garden, and, wise birds ! they have learned to keep inside this estate, and so they escape the guns and snares that might await them elsewhere.

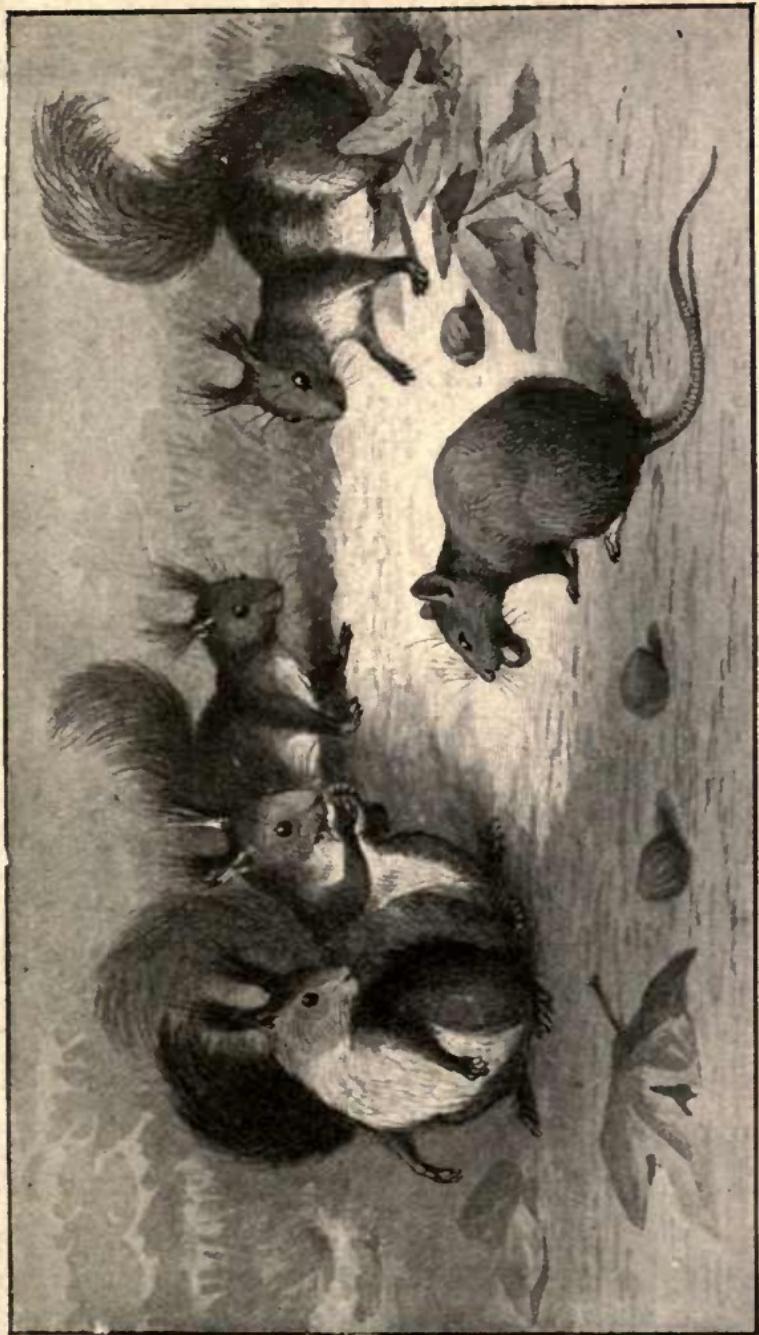
In a certain valley of azaleas, quite near the house, a fine male fox is known to abide, he also having found out that this place is a sanctuary for all living creatures. We happen to know that his mate, or vixen, has her home in a hollow pollard

ash-tree in one of my fields. She goes in and out through a small hole in the trunk of the tree, and there no doubt she intends to rear her family of cubs in due season.

One day the male fox was scared by hearing the horn of the hunters near by on the common. He very unwisely left his valley, and was sighted and pursued by the hounds. His course had to be across the field where his vixen lay, but he steered wide of her tree and led the hounds a merry run of forty minutes' duration as fast as the horses could go. Strange to say, he was seen stealthily returning to his retreat in the valley after an incredibly short space of time. He had baffled the hounds, and had taken short cuts across the country, so that he was home before even a fleet horse could have accomplished the distance.

There is a black sheep in every flock, and I am obliged to confess that we have tamed one very undesirable visitant. A persistent rat has all this winter taken its share of the provisions which are daily scattered for more deserving folk. Personally, I have no objection to his presence, but he steals the food, laying it up in stores in his hole and amongst the ivy branches ; he bullies the sweet little squirrels, and scares away many of the birds we desire to attract.

A BLACK SHEEP.



There is a gruesome sequel to the history of this rat! Some months after I had written this paper, the rat, which had in a marvellous way eluded every attempt made upon its life, suddenly disappeared. The squirrels and birds fed once more in peace, and we rejoiced in the hope that the "black sheep" had met his fate in some way, although we could not trace his end. Time passed and we had almost forgotten the rat incident, when one of the servants complained of a dreadful odour in her bedroom. Careful search was made in an attic loft above, but nothing was visible except the huge starlings' nests which we knew existed there. The room and the attic were disinfected and fresh air let in, but still the odour continued.

A second visit was paid to the loft; some boards were taken up and, by the aid of a strong search-light, the huge swollen body of a dead rat was discovered. Strewn around it were the heads, feet, and feathers of no fewer than eighteen starlings!

On these the creature must have lived and gloated until it came to an end of its bird supplies. Why it elected to die in the loft instead of making its escape through the way by which it arrived there will always remain a mystery.

The servant remembered sometimes hearing birds screaming in the night, but knowing that

starlings were in the habit of roosting in the attic she thought they were fighting amongst themselves. She did not happen to speak of the circumstance, else I should have suspected that some evil deeds were going on overhead.

Little did I think that we possessed such a "chamber of horrors." Each night this hateful rat must have claimed its victim from amongst the sleeping birds, all powerless as they were in the dark either to escape or to repel their deadly enemy.

This little sketch of my happy animals and birds will, I hope, lead others to share in the great pleasure which their companionship affords. If we will reach out to them, the gentle creatures will readily respond to kindness; indeed, I believe the pleasure is mutual, and that the wild denizens of our fields and woods only wait to know that they are safe and welcome to come forward and enjoy being with us as our friends.

EARLY MORNING NATURE-STUDY

TO a true lover of nature hardly anything can be more thoroughly enjoyable than a quiet hour spent in some shady spot early on a summer's morning, whilst the dew is still upon the flowers, and before any sounds can be heard except those made by happy birds and insects.

In my garden there is a little dell embowered by trees, where I often spend an hour or two before breakfast for the special purpose of enjoying the company of my pet wild creatures.

On one side are five arches, formed possibly some hundreds of years ago, since the great stones are grey with age and picturesquely moss-grown and ivy-clad. Young trees, too, are growing here and there out of the crevices into which the wind has wafted their seeds.

In an open space before me are groups of

HAUNT OF THE PET ROBIN.



stately foxgloves of every tint, ranging from purple through rose-colour to pure white. Some of them have stems fully seven feet in height, each bearing not fewer than a hundred and forty, or fifty flowers.

Not only amongst these foxgloves, but in the lime branches overhead innumerable bees keep up a continuous murmuring sound as they busily gather their morning store of honey.

Various tall grasses are sending up their feathery plumes, and in a special bed where only wild flowers are allowed to grow, teasel, hypericum, valerian, and bog-myrtle are delighting my eyes by the free, graceful way in which they make themselves at home as if in their native habitat.

Under one of the arches the birds always find an abundance of food, which I strew for them several times in the day.

There I see young blackbirds, chaffinches, hedge-sparrows, wrens, and titmice feasting and flitting about, quite regardless of my presence. One advantage of this retreat is that no house-sparrows come here to annoy the more timid birds.

The quietness and peace of this secluded spot is in marked contrast to the scenes I witness near the house. There sparrows reign supreme. They

come down in flocks to gorge themselves and their offspring upon the sopped bread, rudely driving away many other kinds of birds that I would fain encourage.

It may be observed that I have not spoken of robins feeding under the archway, because only one haunts this spot, and he is my special pet, and elects to sit on a bough close to me warbling his sweet low song, and occasionally accepting some choice morsel from my hand.

When he was a brown-coated youngster I began to feed and attract him, and in one week he gained so much confidence as to alight on my hand.

He is now my devoted adherent, flying to meet me in different parts of the garden as soon as he hears my voice.

I am much interested, and I think he is also, in the development of the little scarlet waistcoat which marks his arrival at maturity. I saw the first red feather appear, just a mere tinge of colour amongst the rest, and now daily I see the hue is deepening. If bathing and pluming will tend to make him a handsome robin, he bids fair to out-shine his compeers, for he is always busy about his toilet, first fluttering into a large clam-shell, which contains water, and then becoming absorbed in his preening operations, which nothing will inter-

rupt but the appearance of another robin, who, of course, must be flown at and driven away.

Birds, however, are not my only visitors. Some tame voles or field-mice creep stealthily in and out of the rockwork and find their way to the birds' feeding-ground, where they also enjoy the seeds and coarse oatmeal, and amuse me much with their graceful play and occasional scrimmages. Field-mice are easily tamed and made happy in captivity.

Last year I coaxed a pair of these voles into a large glass globe, and kept them long enough to observe sundry family events, such as nest-building, the arrival of some baby-voles, and their development from small pink infants into full-grown mice, and then I set the whole family at liberty under the archway, where they now disport themselves with all the confidence of privileged rodents.

By remaining absolutely still for an hour or two, quietly reading or thinking, one has delightful opportunities of seeing rare birds quite at their ease.

A green woodpecker, all unconscious of my presence, is clinging to an old tree stem near by, and I can not only hear his tapping noise, but I am able to observe how he is supported by the

stiff feathers in his tail, which press against the tree, and how his long tongue darts into crevices in the bark and draws out the insects upon which he feeds.

I follow his upward progress around the stem until he flies away with the loud laughing cry which has earned for him the local name of Yaffle.

Hawfinches are by no means common in this neighbourhood, but one morning I was much interested in being able to watch three or four of these birds, which had alighted on the top of a spruce fir in this dell. Their golden-brown plumage glistened brightly as they busily flitted from branch to branch, snapping off small fir-sprays with their powerful beaks, and chattering to each other all the while like diminutive parrots.

Now the early morning sun is sending shafts of brilliant light through the thick foliage, and bringing out special objects in high relief.

Just beside me is a large mass of grey stone, moss-grown and fern-shaded. The sun has lighted up one side of this; the rest is in shadow, so that it forms a picture in itself, and my robin has alighted on it as though on purpose to give the touch of colour that was needed.

All my readers may not have so sweet a spot in

which to study nature, but I do strongly commend to them the delight of a quiet time spent alone out-of-doors in the early morning.

The air is then so pure and fresh that it seems to invigorate one's mind no less than one's body, and in the country the sights and sounds are such as tend to helpful thoughts of the love and goodness of the Creator Who has blessed us with so much to make us happy, if only we will open our eyes and hearts to see and understand the works of His hands.

CHANCE GLIMPSES OF NATURE

SOME of the most delightful experiences of the naturalist are those which arise from the stolen glimpses of nature which are sometimes attainable.

We happen to be in a quiet spot, it may be, observing a plant or moss which has caught our attention, when out steals some shy creature, which possibly we have never seen before, and disports itself in charming unconsciousness of our presence.

Only a true naturalist knows what a joy this is, how we scarcely breathe and dare not move an inch for fear of losing this glimpse of a wild creature perfectly at ease and therefore free to display its gestures, habits and occupations.

Such a glimpse I had lately of the green wood-pecker (*Picus viridis*), and of the far rarer lesser-spotted woodpecker (*Picus minor*). Even the "Son of the Marshes" says in one of his books that he

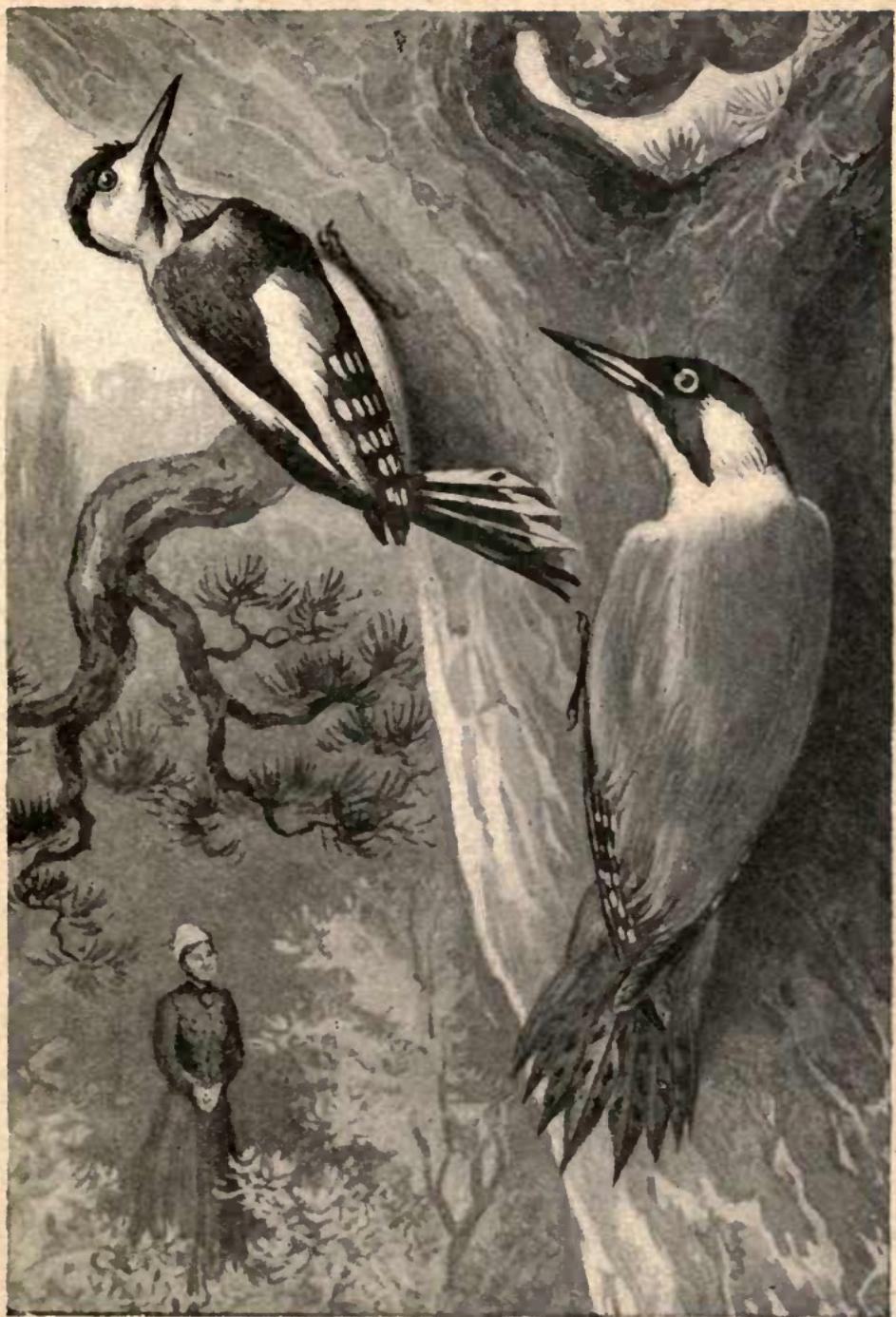
has watched for hours and failed to catch sight of the latter bird, even though he knew it was at work upon the tree beneath which he lay concealed.

It so happened that I was standing quietly behind some thick branches when by chance these two shy birds flew into a great Scotch fir close by and began creeping up the stem in the full sunlight. I had a rare opportunity of noting their beautiful plumage and the very remarkable way in which the lesser-spotted woodpecker makes the loud jarring noise which resounds through the woods in spring.

Its beak seemed to be inserted in a crevice in the bark and then shaken backwards and forwards with indescribable rapidity. I saw it done and yet could hardly believe my eyes, the action seemed so inadequate to produce the volume of sound which resulted from it.

The green woodpecker went to work in a business-like manner, tapping the bark and jerking this way and that in his upward progress, but all too soon the birds caught sight of me and glided swiftly away, leaving me entranced, with a fresh woodland vignette engraven upon my memory.

Although we constantly hear the curious jarring sound of the fern-owl or goatsucker in the summer evenings, and not unfrequently catch a glimpse of



WOODPECKERS.

the bird flitting from tree to tree in pursuit of insects, it is yet difficult to learn much about the life-history of so shy a bird.

The night-jar only appears in the dusky light of evening, and as it nests on the ground on heaths and commons, there is no possibility of seeing the young birds being fed, or of observing any of the domestic traits which we delight to watch in the robins, sparrows and chaffinches that flock around our houses.

Fortune, however, favoured me this year, and afforded me an opportunity of becoming intimately acquainted with the goatsucker and its habits.

Early in July I was told that a night-jar and her two fledglings had been picked up on the common and brought to me. I went to the aviary and found the mother-bird sitting motionless on the ground as if she had been stunned by some idle lad throwing a stone at her. The young birds were fully feathered ; a quaint-looking couple they were, seated side by side, as stolid and motionless as their mother. When, however, I approached them, they hissed like snakes and opened mouths of such portentous size that I can only describe them as pink caverns. I never saw any creatures so grotesque as these youngsters were ; no doubt they were terror-stricken at my appearance, and

hoped to frighten me away by making *themselves* as formidable as possible.

Knowing that in all probability they were famishing, I obtained some scraped raw meat and with great difficulty forcibly opened the huge beaks and fed the poor little waifs. They then nestled close to each other, and shutting their great black eyes contentedly went to sleep.

I now returned to the aviary prepared to act the part of good Samaritan to the mother ; but, to my utter surprise, she rose from the ground and flew swiftly out at the open door, away across the lawn and out of sight.

I suppose she had been but slightly stunned, and in any case I was glad to find her able to fly, for the care and feeding of an old bird, unaccustomed to captivity, is no light matter.

Now I began to realise that I had a pair of orphans on my hands ; the young night-jars could by no means feed themselves, and I could not devise any way by which I could bring them again under their mother's care. I must needs therefore undertake their upbringing, for a time at any rate.

In the intervals of reading in the early morning I had a quiet time in which to study these curious birds and note their peculiarities whilst they thought themselves free and unobserved.

From the shape of their remarkably flat heads I anticipated that they possessed but a low degree of intelligence, and I had no reason to alter my supposition, for the two birds would remain just where I placed them on the floor, scarcely moving for perhaps half an hour. When an idea did occur to them, they would begin to sway their bodies backwards and forwards like little boats on a stormy sea; this would go on with increasing vigour for three or four minutes till they were worked up to carry out their idea, which was sometimes a short flight to the other side of the room one after the other, after which they would remain quiescent again for another hour till another bright thought came to incite them to action.

No sudden noise startled these philosophic birds, who took no apparent interest in anything, and who during the month that I fed them by hand could never be induced to open their beaks to receive their hourly rations.

I was heartily glad when the night-jars were sufficiently strong on the wing to be offered their liberty, and one fine evening they were allowed to glide noiselessly away to find their own diet of moths and beetles.

One would hardly expect that such a shy bird as the ordinary wild pheasant could be so far tamed

as to come to the window to enjoy a daily repast of bread or cake. Such a visitor, however, calls upon us almost always at afternoon tea-time.

A dainty little hen-pheasant makes her appearance and waits patiently until she receives her accustomed portion, which she calmly discusses almost upon the doorstep.

About three years ago I first observed this pheasant lurking timidly under the deodar branches on the lawn, and wishing to attract her, I used daily to throw out a piece of bread and butter on the lawn. Although at first the bird fled away in a fright, yet after a time she plucked up courage, and, rushing forward, would seize the bread and run away with it to eat it at leisure in her hiding-place.

During the past year I have also thrown out food between five and six in the morning, and the same charming bird has now lost her timidity and will come running to meet me as tamely as any barn-door fowl. She raises her little speckled crest, and seems to welcome me with her bright black eyes, awaiting the gift of sweet cake, which she esteems a great dainty.

It is to me a constant pleasure to watch the graceful attitudes of this pheasant; she has the alertness and freedom of a wild bird, she vanishes in a moment if anything startles her, and yet if I

call her quietly and throw out some food, she is quickly reassured and returns to her repast.

Two other hen-pheasants and a brilliantly-plumaged cock-bird occasionally appear, but they cannot persuade themselves that it is safe to remain so near the house. They only venture so far as to secure a lump of bread and then run away to enjoy it in some secret place. It is needless to say that a host of sparrows endeavour to obtain their share of the spoil, and not unfrequently one, bolder than the rest, will watch his opportunity, and whilst the attention of the pheasant is momentarily diverted, the sparrow with a sudden dart seizes the bread and flits away with it out of sight in a moment. Then, I confess, I am always amused to watch the innocent dreamy manner in which the pheasant looks for her food as if pondering upon the strange way in which bread will sometimes disappear without any apparent cause.

I believe this bird nests year by year in a small wood near the house, for, in early summer, I see a mother-bird with her young brood in the park not far from the garden, and I can but hope my gentle visitor may be wise enough to remain within the bounds of this place, which I, not unsuccessfully, endeavour to make a sanctuary for all harmless furred and feathered creatures.

FRIENDSHIPS WITH INSECTS

"Nature ne'er deserts the wise and pure,
No plot so narrow, be but Nature there,
No waste so vacant, but may well employ
Each faculty of sense, and keep the heart
Awake to love and beauty."—COLERIDGE.

I AM afraid that many of my readers will think that it is nothing more than a fanciful idea that one can cultivate friendship with an insect, although they may perhaps recollect that in some of my books I have already given histories of my tame butterflies and beetles.

Stag-beetles are tameable to a remarkable degree, as I proved in the case of one of my specimens, which would follow me, and me only, over the lawn in whichever direction I turned. My friends tried to distract its attention, but it invariably singled me out, and would always creep towards me. It was obvious that in some inscr-

table way it recognised me as the person who supplied it with food and caresses.

Perhaps it may interest those who, like myself, are kept much at home by ill-health to hear of creatures, easily attainable, which can be kept as pets for a longer or shorter time according to their species. It must be remembered that insects, as a rule, are very short-lived. The May-fly or *Ephemera* lives but a single day, but there are many other two- or four-winged flies which can be made happy for days and weeks if they are supplied with suitable food, and granted as much liberty as possible.

I never attempt to keep any winged pet unless I feel sure that it will be contented in captivity. It is easy to discover from its conduct if it is chafing and miserable, fluttering incessantly up and down trying to find some mode of escape ; if it does this, the prison doors must be opened, that it may soar away into the open air it is pining for. But in other cases an insect will make itself happy in our care, and then it is to me a keen interest to try to anticipate its needs in the matter of food. A strawberry dipped in sugar, a lump of sugar moistened with cream, and the pollen of flowers are almost certain to meet the needs of our various pets. Certain predaceous beetles which live upon

flies and other insects are an exception, and for them we must provide morsels of raw meat for their dietary. It is only needful to watch the insect life which is going on around us out of doors to learn that it consists mainly in a struggle to obtain food, and to guard against surrounding enemies. Now, if I can shelter any winged creature from the constant fear of molestation, supply its requirements in the way of food, and allow it to enjoy a measure of free-will and liberty, then I can see no cruelty in retaining it in my possession long enough for me to study its special habits and peculiarities. In this way only can one arrive at certain facts in the life history of insects, and then have the pleasure of passing on such information to a circle of readers who may not have my opportunities for study of this kind.

If I turn to a scientific book to obtain some knowledge of a curious fly, this is the kind of help that is afforded :—

“ *Eristalis tenax*.—Head semi-circular, epistoma somewhat depressed above, with a distinct scapula near the peristoma. Labrum long, lingua acute, maxillæ subulate, curved, much longer than the lingua.”

Now this may be very interesting to a professional entomologist, but it does not convey

much information to an ordinary reader, and yet this is the scientific description of my drone-flies, interesting creatures which I kept through a whole winter until they were coaxed into the circle of my winged friends.

Daily cared for and made happy, they confided to me something of the secret of their being, and thus they became tame and interesting pets, whose habits, as some of my readers may remember, I have described elsewhere.

MY BLUE-EYED BEES.

The species of solitary bees known as *Osmia aurulenta* has a curious preference for laying its eggs in empty snail-shells, putting in a store of suitable food for its young grubs, and then closing up the mouth of the shell with mud. As our soil in Stanmore does not seem to suit the requirements of snails, and as we therefore never find any of their shells lying about, these special bees had not come under my notice until a friend sent me some shells of the Common Snail (*Helix aspersa*) filled with dried mud, which I was told had been placed there by this Osmia bee. I kept these specimens through the winter in a warm room, and one morning about the middle of April I was delighted to see that a little golden-brown

bee had hatched, and was sitting on one of the snail shells. The little creature was perfectly tame, and allowed me to examine it closely with a magnifying glass, through which I could see its soft downy body, smaller than a honey-bee, but somewhat resembling it in form, with the distinctive difference that it possessed large pale-blue eyes.



OSMIA BEES.

This colour is, I believe, rare in the insect world except in the case of dragon-flies.

Quite a colony of these bees emerged from the shells and fed peaceably on honey and pollen for a few days, until I had learned all I desired about their appearance and habits, and then they were gently transferred to some spring flowers in the garden, where they would find congenial food and be able to carry out their natural instincts in founding a family to be hatched next year.

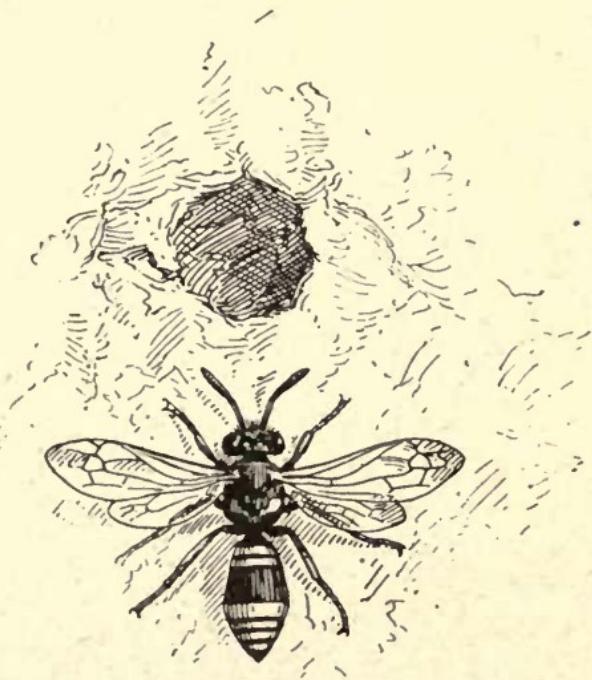
A SOLITARY WASP (*Odynerus*).

For nine years past a certain small hole in the house-wall close to our garden door has been the cradle of a succession of small solitary wasps.

Solitary bees and wasps are so called because, instead of living together by thousands in a nest like the honey-bee and common wasp, a great number of species exist in pairs, and the labour of forming the nest and providing food for the grubs is carried out by the female alone in the manner I will now describe. Each year, about the 24th of June, I find the hole, which has been closed up with mud throughout the winter, has been opened, the tenant has hatched, and before many days have passed I am sure to see the slender black and yellow wasp hovering near its birthplace, preparing in its turn to lay an egg there.

It will place a due supply of food for the young grub which will be hatched, and then the mother wasp will close up the orifice with grey mud. All through the winter the egg remains quiescent until the spring sunshine brings it to life, to pass through its various stages of grub and chrysalis, and then, true to its hour, it will hatch into the perfect insect about the 25th of June. As I keep a Nature

Study journal I am able to speak with certainty as to dates. In the year 1902 the *Odynerus* hatched on the 24th of June and then laid its egg and closed up the hole on the 12th of July, and I often



ODYNERUS WASP, MAGNIFIED.

wonder if the insect's life is limited to these three weeks.¹ This small wasp is a gentle harmless little

¹ In 1903 this *Odynerus* hatched on the 8th of June. The weather being cold and wet, I imagine the wasp did not survive, as the hole has remained empty ever since that date.

creature. I have never known it to use its sting, even if it possesses one, of which I am not sure. I often find an *Odynerus* on the window-pane in summer, and take it on my hand that it may enjoy an unwonted feast of sugar dipped in cream, which mixture, as I have already said, appears to be peculiarly appreciated by bees, flies, and wasps of all kinds.

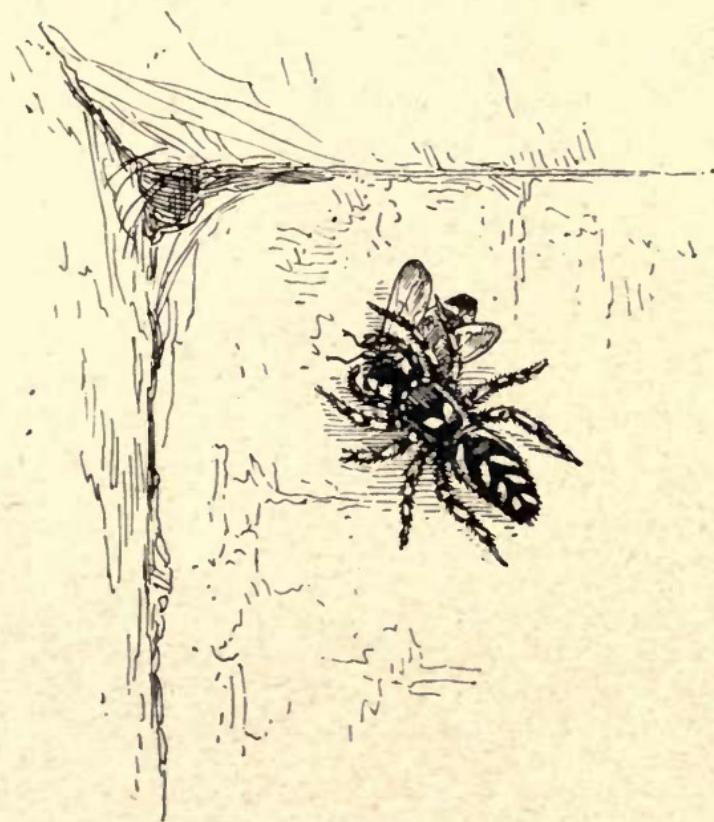
A ZEBRA SPIDER (*Salticus scenicus*).

Before I speak of my Zebra spider, I must premise that it does not possess the distinctive characteristics of an insect. In technical language true insects are defined as possessing two antennæ, six legs, and an articulated body in three divisions. Now a spider has no antennæ, it has eight legs and a body consisting of two parts only, which are not ringed or articulated, as is the case with beetles, flies, and other true insects.

For some years I have known one of these Zebra spiders, and could always find it in warm summer days stealthily tracking about on the wall of the house in the sunshine looking for stray insects.

The Zebra spider makes no regular web beyond a few strands near its house door. Its mode of capture is this: it watches its prey alight upon the

wall, and then slowly but surely draws nearer and nearer, until it can spring upon its victim, giving the fatal bite which stupefies it sufficiently to allow the spider to drag it to its hole. I could



ZEBRA SPIDER.

never discover the retreat of this particular spider until this summer, when, glancing at the wall, a large Hoverer fly attracted my attention as I passed, and, wondering why it remained so quietly

in one spot, I went near to examine it, and found it was dead and being devoured by my spider. I watched until the Zebra dragged the body slowly to a crevice in the angle of the window-ledge, where the little robber settled down to enjoy his feast.

Now, if I take a dead fly and place it near this hole, my spider friend soon comes out and appropriates it. Examined with a lens, one cannot but admire the beautiful and varied markings and stripes to which this spider owes its name. The differences in character in insects are very curious, and, relatively speaking, seem to be quite as marked as in human beings. The excitable and the stolid, the clever and the stupid, all have their counterparts among the individual members of the insect world. Take a blue-bottle fly as an instance; can anything be found more unreasoning and foolish than the way in which it will bang itself against a window, never learning the nature of glass by any number of concussions? I would place at the other extreme the Humble-bee fly (*Bombylius medea*), a beautiful golden-brown creature which may be seen in spring hovering over the newly blossoming flowers, poising like a tiny humming-bird and inserting its long proboscis into the flowers to obtain the honey on which it subsists.

If we capture one of the latter carefully, with a gauze net, and place it under a glass shade, its highly nervous temperament makes it so faint with terror that it lies on its back as if dead. After a while, however, it revives and quietly moves around the glass, never touching it, but intelligently searching for some way of escape. I generally place a bunch of sweet flowers in a small vase for the fly to rest upon, and soon we may see it reconciled to its fate and seeking for honey as if in the open air.

Very little is known about the life history of this charming insect. Its larvæ are said to be parasites, feeding on caterpillars and other insects. I seldom see a *Bombylius* after May, or early in June. But for the unusual coldness of this spring, I should have carried out my purpose of keeping one of these flies as long as possible, so as to have learned something of its habits and life-history, but the only specimen I saw I was unable to capture, so I must hope to be more successful at some future time.

Another difference of character may be observed between drone-flies and the honey-bee.

My specimens of the former had been living happily for many months in a glass globe, and one cold, wet spring day, seeing a honey-bee upon the

window-pane, I thought I would save its life by affording warmth and food for a day and night, and let it go on the following day. With the drone-flies it had plenty of honey, and I supposed it would be happy ; but it refused food, and never ceased to buzz up and down until it became exhausted, and I found it dead the next morning.

I imagine that, being accustomed to live in a crowded hive, it could not endure solitude, and my intended kindness led to its miserable death. I might fill many more pages upon this subject, but I think I have shown in these few examples that, close around our daily life, there lie abundant subjects for thoughtful study even in such apparently insignificant creatures as the flies and wasps which flit about upon our window-panes. They have their individualities and instincts, and are worthy of our attention, seeing that they all faithfully perform the part that they are designed to play in the great harmony of nature.

UNDER THE TULIP-TREE

"There is no one who has not been lost in wonder at times at the individual beauty and perfection of the wild flowers, whose blossoming and fading, opening and closing, mark the passage of the seasons and the daily course of the sun in the heavens. We take up at random any single plant from a whole meadowful, and we find that it is as complete in all its parts, and as adapted for its purpose, as though it were the only object in the universe."—
REV. HUGH MACMILLAN, D.D.

ON this lovely June morning I am enjoying an hour's rest beneath the spreading branches of my ancient tulip-tree. The first day out of doors after long weeks of illness affords a pleasure scarcely to be understood by those who are favoured with uninterrupted health. Every sense is gratified ; the sweet freshness of the hay-scented air, the songs of the birds, the flickering of the lights and shadows, the murmuring of bees amongst the flowers—all these minister exquisite delight, and fill the mind with happy thoughts.

The mower's scythe is not allowed to disturb the luxuriant growth beneath this tulip-tree, so that the grasses and wild flowers spring up year after year at their own sweet will. Our squirrels have unwittingly sown quite a miniature forest of young trees by leaving their beech-nuts, acorns, and other woodland provender to take root and grow in the soft green moss. The winds of spring and autumn have also brought here the winged seeds, or *samaras*, as botanists call them, of other trees, and these are germinating and spreading their first young leaves to catch the rays of sunlight.

As I sit here I could gather specimens of eleven different seedling trees. Beech, lime, common ash, mountain ash, hornbeam, sycamore, birch, hawthorn, holly, English oak, and Turkey oak, all are here in miniature.

I must not be tempted to write about them or my book would grow far too lengthy, but I would commend the study of seedling trees as affording an added interest to woodland rambles. When dried, named, and neatly arranged in an album, the leaves of these young trees afford good examples of the curious variation in the form of cotyledon leaves. My subject to-day shall simply be the wild flowers growing in the grass around my seat.

Some trees seem to have a baneful influence and will not permit the growth of plants beneath their foliage. Under a beech-tree, for instance, one can scarcely ever find any verdure, and in my own beech-woods, where even moss declines to grow, nothing but dry crisp beech-leaves strew the ground, the only living growth, excepting fungi, being the germinating beech-nuts. These appear to flourish in the leafmould into which they have fallen in the previous autumn. Under my tulip-tree, however, wild flowers seem to grow happily enough. Both the white and the blue milkwort (*Polygala vulgaris*) show their tiny blossoms amongst the grass. This is one of the few wild flowers which can boast of three colours, blue, white and red, and where it grows in large and distinct masses, as I remember seeing it, years ago, on Salisbury Plain, the effect is extremely beautiful. It prefers a chalky soil, and only on open downs of that description can it be seen in luxuriant beauty. In our own stony ground, the plants are few and far between, but in contrast with the bright pink of the marsh red-rattle, which grows abundantly on our common, the azure blue of the milkwort is a welcome tint, blue being infrequent amongst our wild flowers.

The old Greek name, *Polygala* (much milk),

seems to have been given to this plant because of its reputed quality of promoting the secretion of milk. In olden days it was called "Rogation flower," because it formed part of the garlands which were carried in procession during "Rogation" week, the bishop of the diocese and clergy traversing the bounds of each parish, offering prayers that plague and tempests and all other evils might be averted.

As early as the year 550 A.D. these processions are mentioned. Izaak Walton tells how the judicious Hooker took this opportunity to "drop some loving observations and to express some pleasant discourse with his parishioners."

Thus the innocent little milkwort leads our thoughts to a far-away past, as it "purples all the ground with vernal flowers."

The surrounding lawn is, in places, quite silvery with the half-curled leaves of the mouse-ear hawkweed. Its finely-cut yellow flowers are produced on unusually long stalks under the shade of this tree. The habit of the plant is to grow in rosette form with one flower rising from the centre. The outermost leaves have the longest stalks, and in order that all may obtain their due share of light and air, each succeeding leaf has a shorter stem, and thus the plant attains the rosette shape.

The under side of each leaf has a white downy surface, and hence when the edges of the leaves curl over in dry weather, the silvery effect upon the lawn is produced. The upper side of the leaf is dark green with a few very long white hairs lying flat upon the surface; one would like to know of what use they can be, but like the curious silvery hairs of the small field-rush



ROSETTE FORM OF LEAFAGE.

(*Luzula campestris*), no doubt they fulfil some useful purpose in the economy of the plant.

The humblest weed can supply food for thought as to the uses of its various parts, and it is for that reason that I am to-day limiting my observations to the wild flowers that are growing within my reach. This hawkweed has shown us that rosette-shaped plants bear their leaves in the

best possible way for obtaining light and air, and, if we have access to any collection of saxifrages, we shall see the rosette form in every variety of graceful arrangement. Another important principle of growth is shown in the rib-



SAXIFRAGE.

wort plaintain (*Plantago lanceolata*), which is a troublesome weed upon my lawn. This plant possesses what is called a tap-root, that is, a root somewhat resembling horse-radish, with its rootlets tending downwards. It is essential that the rain should be guided to this central root,

and therefore we find that the leaves on this kind of plant grow from the centre, and are placed at such an angle as to act as channels to convey dew and rain down to the tap-root.



FOXGLOVE.

(Leaves conveying rain to central root.)

If we bear this principle in mind, we shall find that a large number of plants are thus formed. Some have deeply furrowed leaves, and where there is a leaf-stalk, it often has a channel down

the inner side to act as a conduit for the falling rain. Amongst foreign plants the banana is a remarkable example of this structure. Down the centre of each leaf runs a groove an inch wide and deep, so that we can picture the tropical



ACANTHUS.

(Leaves conveying rain away from central root.)

rains rushing down the broad, upright leaves, conveying floods of welcome moisture to the root. In the case of trees exactly the opposite principle usually prevails. Their roots spread out far and wide, and the rootlets, which alone are able to convey nutriment to the tree, extend in

a circle many feet away from the tree trunk. If we examine the foliage of deciduous trees, we shall observe that, as a rule, the points of the leaves tend outwards and downwards, so that they convey the rain away from the centre to the outside limits of the tree, where the rootlets in the ground can receive and absorb it for purposes of nutrition. Even with coniferous trees this is the case. After long-continued heavy rains I find the earth perfectly dry around the stem of a certain oriental spruce fir with low-growing branches, and beneath it are untidy holes which show that the pheasants have been enjoying their dust-baths as usual.

The consideration of leaf-production has led us away from our wild-flower study, and space will only allow me to mention one or two plants whose appearance in this place was rather puzzling. I could not account for such an exclusively field plant as the purple corn-cockle (*Agrostemma githago*) flowering here in the long grass, and buckwheat also springing up under a deodar near by, until I remembered that in winter we liberally supply the starving rooks with the sweepings of the granary, and no doubt the cockle-seed was strewn amongst the wheat and barley. For some of my pets I have to

obtain packets of mixed seeds of sunflower, hemp, millet and buckwheat, and, as outdoor birds enjoy a few handfuls from time to time, the buckwheat has chosen, in this rainy year, to spring up in great vigour. The flowers of the buckwheat (*Polygonum fagopyrum*) are very interesting, and at the same time somewhat puzzling to the observer. The blossoms are freely visited by insects for the sake of the honey secreted in the little tubular florets. When, however, an insect withdraws from one flower and passes on to another, it finds quite a different arrangement inside the second tube. In one the pistil, or central part of the flower, is elongated and the stamens very short, while in the other the pistil is low down and the stamens stand high up, as if to guard the entrance against intruders. There are, in fact, two kinds of flowers growing on the same plant, an arrangement that tends to secure that cross-fertilisation which is so essential to the production of vigorous seed.

Growing in company with the buckwheat and from the same source is a plant of the black bindweed (*Polygonum convolvulus*), which curiously imitates the twining habit of the field convolvulus, differing from that cornfield pest by producing

more seed and no running underground stems. A young vigorous plant of the broom (*Sarothamnus scoparius*) has gained quite an established place amongst the grasses growing under my tulip-tree. When the leaves fall in autumn, I am afraid this broom may disappear in the clearing-up process, unless it is honoured with a protective label.

The flowers of the broom are amongst the most remarkable in the garden, and are visited by insects in large numbers. The entrance of a bee into a newly-opened broom flower causes the stamens to spring up with a slight explosive force by which the abdomen of the bee becomes dusted with their pollen. When the bee flits to another and older flower on the same stem, in which the powder has been discharged and transferred to another pistil, the insect receives the pollen on its back, and in both cases it is the unconscious means by which nature carries on the cross-fertilising process so essential to healthy plant life. I have only space to notice one more of the many plants growing in my tulip-tree circle. This one is well-known to all my readers as the charming dog violet (*Viola canina*). One of the early harbingers of spring, and yet often lasting on till the end of July,

these wild violet flowers seem to me to have a special grace of their own as we light upon them in mossy crevices around old tree-stems. After the pale blue flowers have faded, the plant produces other flowers, which are seldom noticed as they are inconspicuous, on short stalks near the root, and appear to be mere buds; but if we carefully pull them to pieces, we shall find they are flowers, but differing from the coloured ones in several particulars.

The coloured petals are absent, and the other parts are reduced to mere scales; still these flowers produce seed, and as they do not open, insects cannot visit them, so botanists call them self-fertilised or cleistogamous flowers. Here we have another glimpse into one of Nature's wonderful ways of securing for the plant continuity of life by providing seed that is formed late in the season, and which therefore provides against the possible failure of the flowers that open in the early months, whose fertility depends upon insect visitors.

If the plant life beneath a single tree has yielded so many subjects for thought and study, I hope my readers will be encouraged to believe that around them on every side lie hidden wonders in this beautiful world of ours, which

will well repay any time they can spare from their life-work for the investigation of the special branch of nature-study they may be led to pursue.

SEEDLING TREES

AS an admirer of trees, I have for years past been led to study their growth from the germination of the seed onward through the different stages of their life, until they are old enough to produce their curious flowers or catkins.

I can remember the time when it was a revelation to me that trees had flowers, and, supposing that there may be amongst my readers some who are as little acquainted with their beauty as I was then, I will venture to point out some very interesting lines of study for those who have access to pleasure-grounds or woods, where they can wander amongst well-grown trees, and search for their seedlings. These will be readily found growing in the leafmould under the shade of the branches. A seedling-tree is often so remarkably unlike its parent that we

shall not easily recognise it, and only after some study can we feel sure as to its identity.

As it adds greatly to the interest of a country ramble to have some pursuit in view, I would strongly commend the collecting and drying specimens of these seedling trees.

They need only to be placed between sheets of blotting-paper, and laid in a press or under a heavy weight until they are dry enough to be mounted, the paper being dried every day to prevent mildew.

It affords a pleasant evening's occupation to arrange these small specimens in a blank book, with their Latin and English names, the locality and date when obtained, and any items of special interest that may be worth recording.

THE BEECH.

The young beech presents two flat broad leaves called cotyledons, and, until the next pair of leaves appear, no one could guess that they had any relation to a beech-tree. The secret is revealed when we find, as is sometimes the case, the small three-cornered husk of the beech-nut still clinging to the unfolding cotyledon.

During the first year these four leaves only are produced; they drop off in autumn, the stem

becomes woody, and in the following spring a tuft of delicate and perfect beech-leaves will appear, with light brown scales at their base. In our dried collection there should be a first and second year seedling, to show the difference between them. The beech only produces its nuts



BEECH. (*Fagus sylvatica.*)

every second year, and when they are plentiful, the squirrels eagerly collect them for their winter store, and may be seen here tearing across the lawn, bearing away their treasure to some secret hiding-place. Since scarcely any plant will grow under a beech-tree, the nuts are easily seen, and

but few are left after the squirrels have raided the woods.

A high wind in autumn probably carries away a great many beech-nuts to some distance, where they drop into crevices and remain dormant until the warmth of the sun in April and May causes them to germinate. This may account for our finding the young plants growing on walls or in flower-beds where no beech-trees are in sight.

THE HOLLY.

This tree first appears with two oval cotyledon



HOLLY. (*Ilex aquifolium.*)

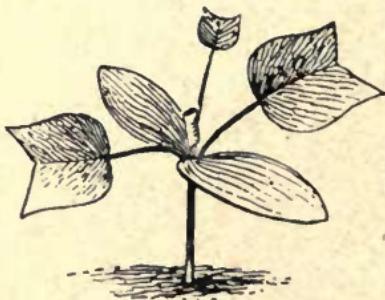
leaves, and later on one or two small prickly leaves, which survive the winter. The following year the

prickly leaves increase in number and size, so that the seedling is then more easily seen and distinguished.

THE TULIP-TREE.

The tulip-tree so seldom produces fertile seed in England that it was a pleasant surprise to find that young seedlings had been produced from the cones of our own tree.

The drawing shows a compact little plant with



TULIP-TREE. (*Liriodendron tulipifera*)

oval cotyledons and charming little leaves, almost exactly resembling the adult form. A young tree I obtained from a nursery seems to grow but very slowly, and the leaves in their early years are of peculiar shape, having very deep divisions ; it may possibly be a mere sport, or the plant may become normal in form as it grows older.

THE SYCAMORE.

Sycamore seedlings are the most easy to



SYCAMORE. (*Acer pseudo-platanus.*)

find of all the baby trees. The keys or

winged seeds are so light that they are readily blown in all directions by the autumn gales. Wherever there is a crevice and a little moisture these seeds readily germinate. If it were not for the mowing-machine, my lawn would, in a few years, become a sycamore wood, so thickly is it covered in spring with the strap-shaped cotyledons of this tree. The young plants are liable to many variations; they appear with three and even four first leaves, and in one case the three were succeeded by three perfect leaves, but that is quite an unusual instance.

THE ENGLISH OAK.

The best way to obtain good specimens of such trees as the oak, horse-chestnut and Spanish-chestnut is to place the acorn or nuts in damp moss, and then we have the pleasure of watching the curious process of germination.

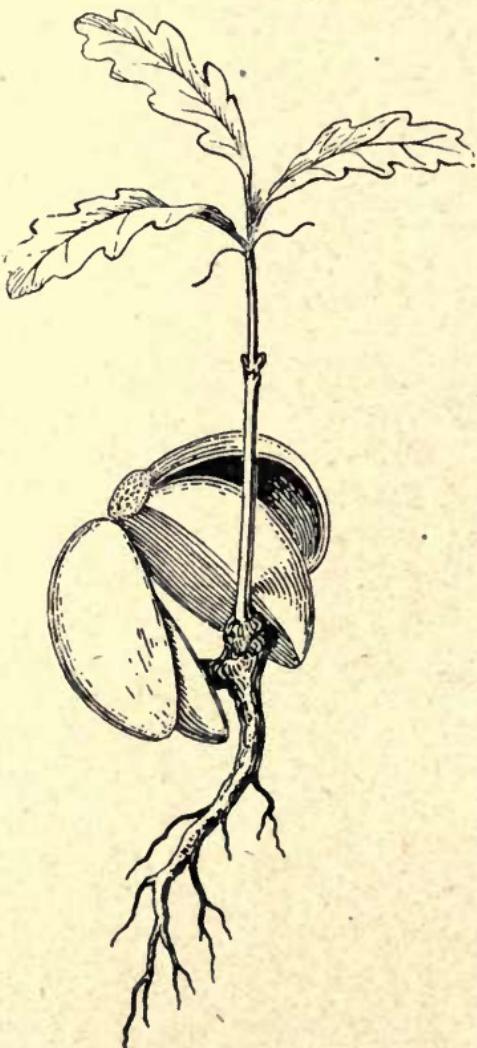
The plumule, which will be the tree stem, breaks out of one side of the chestnut, and from it a second stem grows downward to form the root, and white rootlets covered with fine hairs grow thickly from it, to enable the young plant to absorb moisture and nutriment.

Cotyledon leaves are never seen in the case



TURKEY OAK. (*Quercus cerris.*)

of these nuts or acorns, since the two halves of



ENGLISH OAK. (*Quercus robur.*)

the nut are the cotyledons, and they remain inside the husk, so that the first we see of the young

tree is a stout green stem with two or three perfect leaves.

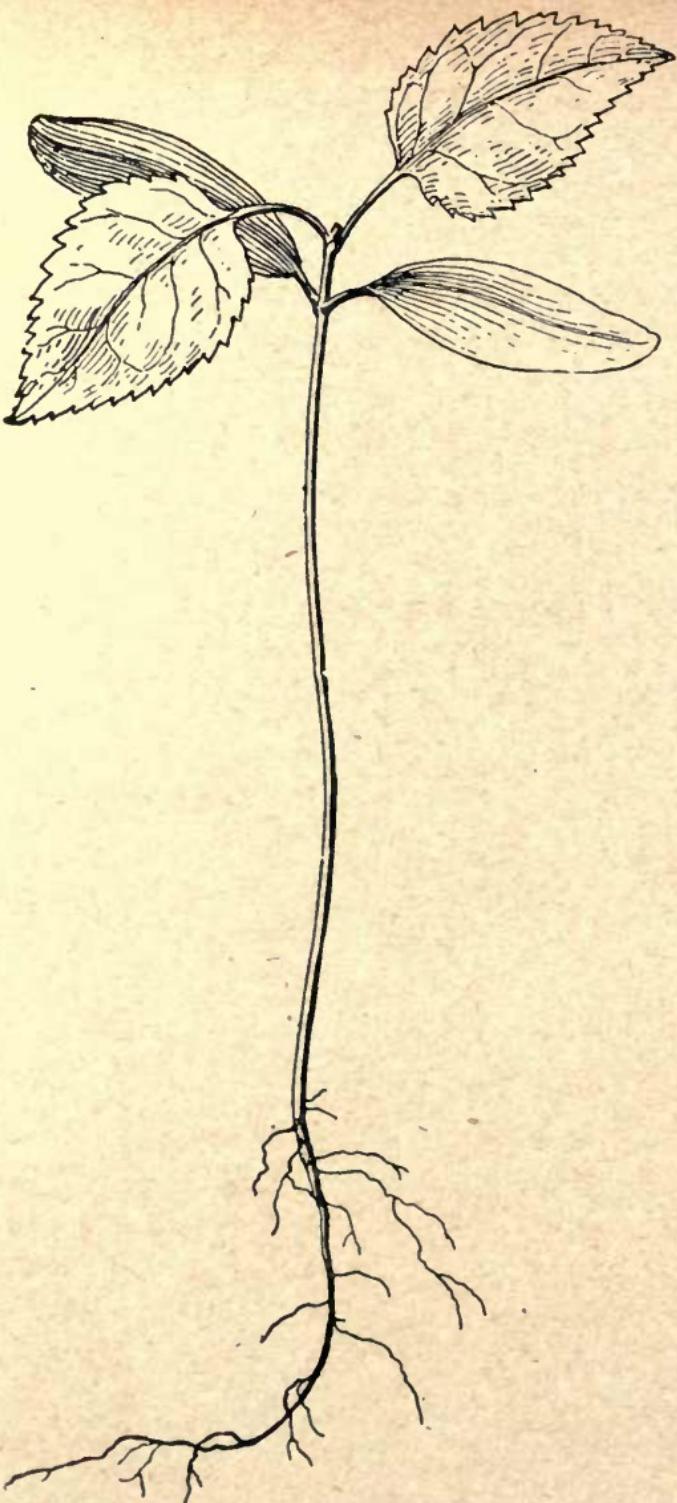
As it is not possible to include these hard nuts in our collection, I have overcome the difficulty by simply drying the young oak or chestnut, and, when fixed in its place, adding a sketch in water-colour of the cotyledons and outer husk, as shown in the drawing of the English oak.

COMMON ASH.

For many years I failed to find any seedlings of the common ash, for this reason: the ash has a pinnate leaf, and I naturally looked for something similar in its cotyledon; but, strange to say, it begins life with a simple oval leaf that might belong to a poplar or a pear-tree. In the second year it has three leaflets, and in due time it appears with four or five pairs of leaflets, and a terminal one, as in the adult tree.

THE LIME.

The cotyledons of the lime are curiously notched, and so unlike the adult leaves that we shall hardly guess what they are until they are old enough to develop the second pair of leaves, which are like those of the parent tree, only somewhat more elongated in shape.



COMMON ASH. (*Fraxinus excelsior.*)
First year.

The lime-trees here are much ill-used by the squirrels, who strip off the soft layers of fibre.

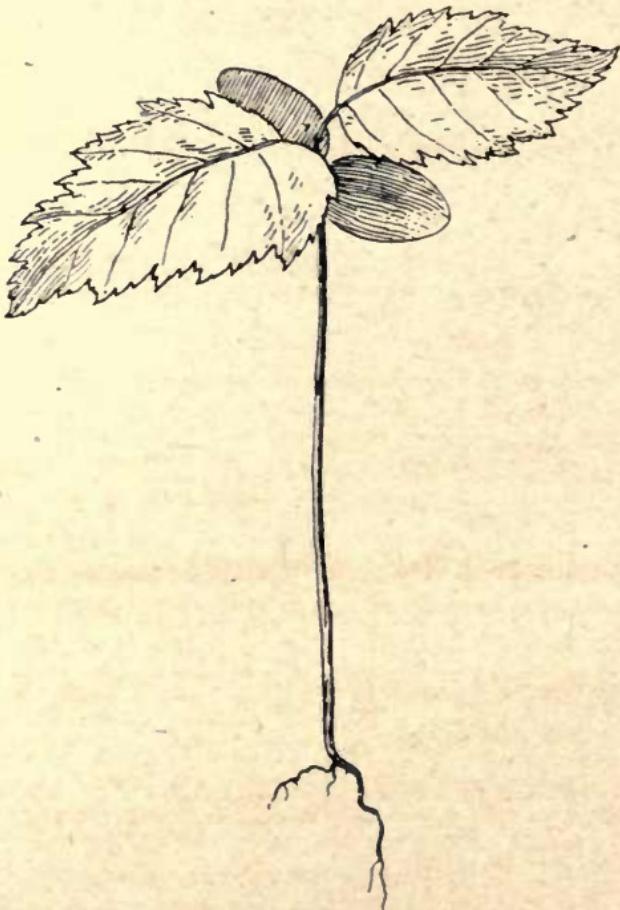


LIME. (*Tilia Europea*.)

just beneath the bark of the smaller branches, and use it to line their nests. The Russian lime furnishes the material of which bast matting is made.

THE HORNBEAM.

The hornbeam has two small oval cotyledons, and the succeeding leaves are almost perfect in

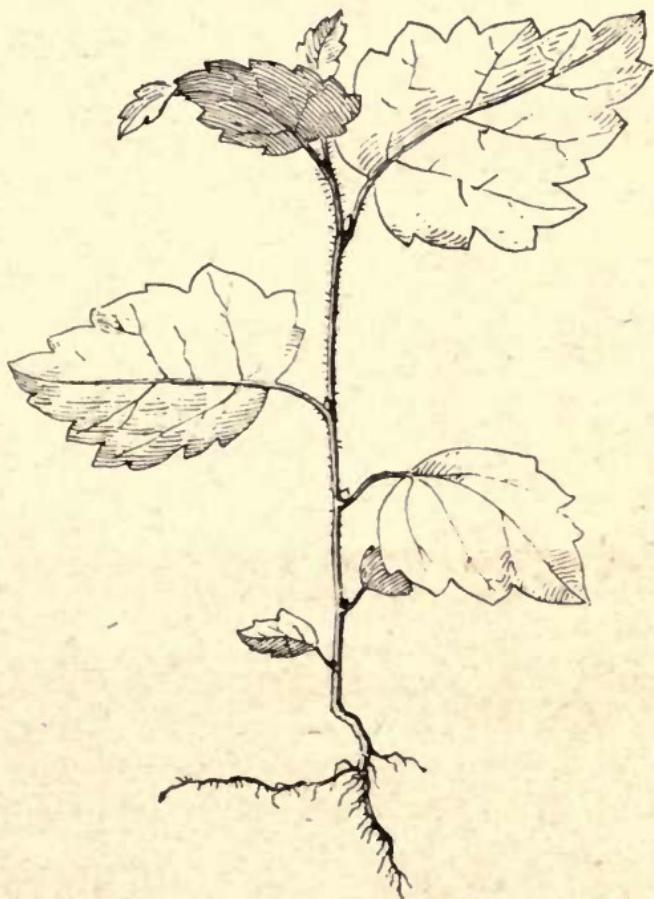


HORNBEAM. (*Carpinus betulus.*)
First year.

shape, but we seldom can find specimens with more than one leaf in the first year, or, maybe, one and an immature second.

THE BIRCH.

The seed of this tree being extremely small, its first-year seedling has been, so far, invisible to me ;



BIRCH. (*Betula alba.*)

Second year.

I can only find it in the second year, when, as in the drawing, it shows several well-formed mature leaves which, in this early stage, are soft and downy.

THE MOUNTAIN ASH.

We might easily mistake the seedling mountain



MOUNTAIN ASH. (*Pyrus aucuparia.*)

ash for a minute fern, its leaves are so small and finely divided.

It requires careful searching to find a specimen



HAWTHORN. (*Crataegus oxyacantha.*)

Second year.

of this tree in an early stage ; it scarcely shows above the grass or moss in which it is growing ; the drawing is therefore taken from a seedling in its second year.. It was one of nine species of trees I found growing under a deodar on the lawn ; the berry had no doubt been carried there by some bird which had dropped the seed from a branch above.

THE HAWTHORN.

In the first year this tree has two small oval cotyledons, and two perfect-shaped leaves, so it is easily to be distinguished from other seedlings. It seems to germinate almost as readily as the sycamore, and is widely spread, owing to birds eating the berries and dropping the seeds everywhere.

Space will not admit of further examples. I hope these will be sufficient to induce many young readers to turn their attention to our English trees. With this object in view, the interest of their country rambles will be immensely increased, and with the aid of such a book as "The Forest Trees of Britain," by the Rev. C. A. Johns(C.P.C.K.), the specimens can be named, and in time the dried collection will be both interesting and valuable.

ECCENTRIC FLOWERS

WHEN we see some strangely-shaped flower we are rather apt to regard it simply as a freak of nature, and pass it by without giving any thought to the reason of its eccentric form or colour.

This was very natural in former times before the science of botany had made its present advances, but of late years much careful study has been bestowed upon the remarkably shaped flowers of orchids, aroids, and other plants. This study has revealed the fact that each organ of these blossoms has its own especial use in the life history of the plant.

For instance, we import orchids from tropical and other countries where the birds and insects are of a wholly different type from our own, and upon investigation it is discovered that these

flowers, which present to us every variety of weird formation, are exactly suited to the kinds of birds and insects which are to perform for them the important office of fertilisation.

I have thought that it might interest nature-students to hear a little about a few of the curious foreign plants which appear in my conservatory month by month.

The aroids are a family of plants that are exceptionally quaint in their appearance.

The flowers are very minute, and are usually developed upon a thick central stalk called the *spadix*. In the common arum (*Arum maculatum*) they are arranged in rings or whorls, the lowest consisting of pistils only, then a ring of stamens, and finally some barren flowers. Its most curious feature is the large, greenish, purple-spotted bract which enfolds the central stalk and flowers; this, I think, gives the "Lords and Ladies" of our hedges its title to be included amongst eccentric flowers. If we examine a blossom we shall notice that it is constricted in the centre so as to form an inflated chamber enclosing just the region of the stalk circled by the flowers, and, by the way, let us avoid inhaling its perfume, for we shall not find it that of roses or violets, but something suggestive of putrid meat, just the kind of odour that is

attractive to the smaller flies which are required to effect the fertilisation of the flower.

The bract or *spathe* is lined inside the inflated part with hairs; the flies pass in through the narrow channel, and by means of the hairs, which point downwards, they are prevented from escaping until they have helped to distribute the pollen-grains on the pistils. The result is that the latter are fertilised and so seed is formed.

It is very evident that the unusual shape and general character of these flowers tend to subserve an important purpose in their lives, and by studying the formation of an English *Arum* we get the key, as it were, to some of the floral puzzles presented to us in foreign examples of this and other species.

I have many exotic plants growing in the glass-houses and gardens here, and I will try to explain the service performed by three or four of the most beautiful of these striking forms.

Last spring there bloomed in the conservatory a very extraordinary flower; the *spadix* was slightly swollen and rounded, with the flowers growing in separate circles on the stem, as in the *Arum*.

The queer-looking *spathe* was green outside and a shade of olive-brown within, covered with

yellowish spots suffused with dark purple. Unlike the *Arum* this *spathe* was elongated, and as



SAUROMATUM GUTTATUM.

it hung down with a wavy outline it looked remarkably like a large spotted lizard, from which resemblance it has been named *Sauromatum*



AMORPHOPHALLUS RIVIERI.

guttatum.¹ It is a Himalayan plant, and from its overpowering and offensive odour I have no doubt it is a popular plant with all the flying insects in its native regions.

My specimen became fertilised and produced its seed.

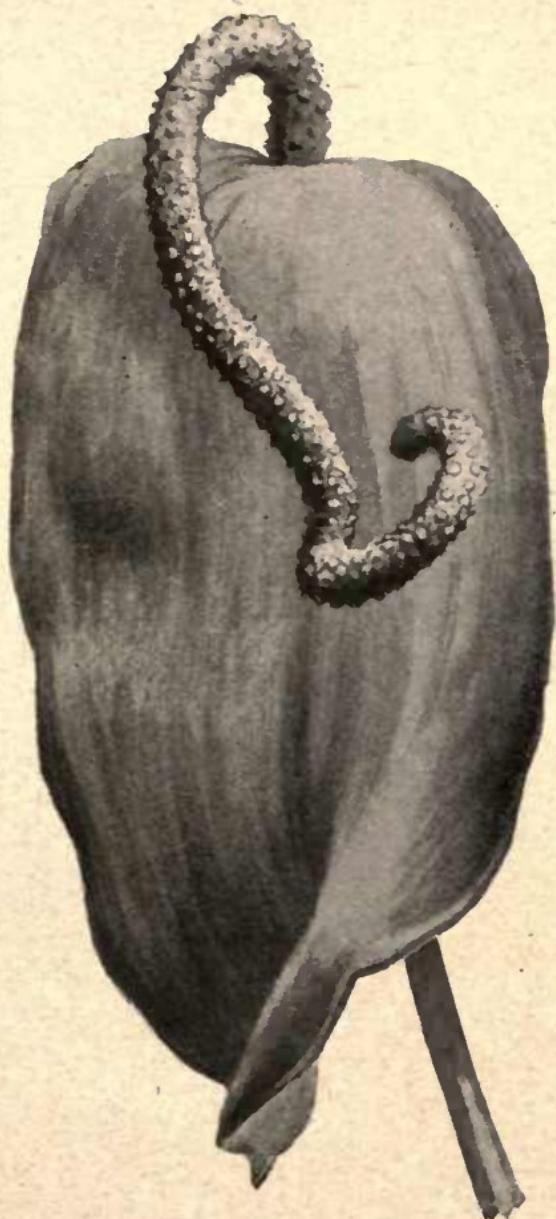
Another plant of the same family flowered in midwinter. In this case out of a huge pot, as large as a man could lift, rose up a solid dark purple stalk, three feet high; about two-thirds up this *spadix* came out a spreading bell-shaped *spathe* of a lurid purple colour faintly spotted on the inside. The flower organs were arranged, like those of the *Arum*, in circular rings included in the bell-shaped *spathe*. The upper part of the *spadix* was much swollen, as shown in the drawing.

This plant, the *Amorphophallus rivieri* of Cochin China, possesses such a truly dreadful odour that we were obliged to banish it from the conservatory, and if it exists in any quantity in its native habitat it must render the air almost insupportable.

Its blossoms are, no doubt, highly attractive to the insect tribes whose aid it requires for its fertilisation.

From the malodorous scent of these aroids it is

¹ From two Greek words meaning a spotted lizard.



FLAMINGO PLANT. (*Anthurium scherzerianum.*)

pleasant to turn to the lovely scarlet bracts of the Flamingo plant (*Anthurium scherzerianum*).

Here we find the *spadix* twisted and contorted,



ANTHURIUM ANDREANUM.

and the flowers, unlike those of the *Arum*, are hermaphrodite and embedded in the red tissue of the *spadix*. They possess neither honey nor

scent, but their brilliant colour no doubt renders them highly attractive to various insects.

In Brazil, where these plants grow, hummingbirds are abundant, and no doubt they play their part in the fertilisation of the flowers, not that there is any attraction for them in the blossom itself, but the hovering flies lead them to alight upon the protruding *spadix* and thus they help to distribute the pollen.

These fly-haunted plants are sometimes death-traps to the inquisitive little birds which are attracted to them.

A New Zealand shrub, *Pisonia brunonianæ*, has such sticky carpels that birds alighting on them in search of insects are held fast as if by birdlime.

A writer¹ speaks of having found a dozen or more dead and dying birds glued to the fruit-bearing branches of pisonia.

We must not omit to mention the very remarkable fact that there is a distinct rise in temperature in the enclosed part of the *spathe* in many of the aroids; this makes the blossom all the more attractive to the flies, as warmth is just what these insects delight in.

¹ *Nature*, Nov., 1884.

GLORIOSA SUPERBA.

This extraordinary-looking flower is a native of tropical Africa and Asia, and therefore it needs to be grown in a very warm house where a moist heat may suggest the atmosphere one would have to breathe in an Indian jungle.

It is very interesting to visit my stove-house and see the lovely flowers of tropical countries growing luxuriantly, the bananas ripening, the papyrus with stems ten feet high reaching up to the glass roof, all kinds of curious climbing plants clothing the interior of the house with their varied leafage and delightful blossoms; yet, with all their attractions, my visits to this house are always very brief; the humid air seems after a few minutes to become unendurable, and I learn to estimate the perseverance and courage of missionaries and others whose labours have in many instances to be carried on year after year in the enervating climate which exists in my tropical greenhouse.

But I must return to my subject, the *Gloriosa*, which is a member of the lily family, though very unlike a lily in the form of its flower and in its habit of growth.

It may be well to remind ourselves of the

GLORIOSA SUPERBA.



arrangement of the parts of a common tiger-lily. In its centre, in an erect position, is the seed-case or ovary, and growing from below the ovary are two sets of structures, the six stamens and six petals or perianth leaves, the whole supported upon a short stalk. Now if we turn to the *Gloriosa*, we find an upside-down sort of arrangement ; the whole flower is reversed, so that the ovary points downwards and the stalk appears to come from the top of the flower ; the style is bent abruptly sideways, and assumes an almost horizontal position ; the stamens radiate from the ovary in all directions, each stamen bearing a large anther or pollen-case filled with dark red pollen. The six petals are sharply reflexed and twisted, the lower part of each petal is dark orange-red, whilst the upper part is amber-coloured, the whole forming a brilliant and conspicuous flower. We must not fail to observe that the midrib of each leaf is lengthened out into a twining tendril by means of which the lily attaches itself to surrounding vegetation and keeps climbing higher and higher up the sides of my stove-house, as if in its native jungle, where every plant has to struggle more or less to reach up beyond its neighbour for needful light and air. The flowers hang in a pendulous manner below the foliage, and this fact, I think,

partly accounts for the curious arrangement of their parts.

The position of the flowers is such that they can easily be seen by tropical insects and humming-birds, these latter finding in the bent style a convenient perch where they can sit and feed either upon the pollen or the juices of the flower, with the result that their feathers become dusted with the pollen-grains, and in their flittings to and fro they render effectual service to the plant by pollinating its stigmas. The sun-birds of Natal frequent the aloe and lily blossoms, and must look wonderfully beautiful as they carry out the work for which they seem specially fitted. Mr. Andersson speaks of this African bird and says: "Its food consists of insects and the saccharine juices of flowers, in search of which it flits incessantly from one flowering tree to another, now settling and now hovering, but glittering all the while in the sunshine like some brilliant insect or precious gem."

ARISTOLOCHIA.

For weird and fantastic form scarcely any flowers can vie with the *Aristolochias*, which botanically constitute a group of plants known as belonging to the *Incompletæ*, though possessing

some affinity to the *Aroid* family, discussed in our previous paper.

The blossom of the *Aristolochia*, in each of the species, may be divided into three regions, an upper part that is often dilated and developed into a most conspicuous structure, the middle which is constricted and forms a very narrow passage into the third or lower, which is usually an inflated balloon-like chamber. Several of these plants are growing in my stove-house. One species, *A. gigas*, is a veritable monster; the huge perianth measures ten inches across and is over a foot in length. Before it is wholly expanded, it reminds one of a grey burnouse wrapped round the dusky face of a Bedouin Arab, the interior of the flower being of a dark purple colour, while the surface is thickly covered with hairs, so as to suggest the Arab's hirsute face.

The third and lowest chamber is much distended, and the passage enters it in a syphon-like manner. I must complete this description by adding the fact that a slender tail two feet long hangs down from the lower part of the flower.

It must be strange indeed to come upon this startling flower growing amongst the rich vegetation of a humid Guatemalan forest,¹ and doubtless

¹ Where its flower measures over five feet from the top of the perianth to the end of the tail.



ARISTOLOCHIA GIGAS.

its truly hideous scent attracts hundreds of insects to aid in its fertilisation. One would like to know the use of its slender hanging tail ; possibly it conducts to the flower some special insect not provided with wings.

I read that a single spathe of a certain flower akin to the *Aristolochia* was found to contain more than two hundred and fifty carrion beetles of eleven different species ; so it may be that our *Aristolochia* provides a hanging staircase for some highly desirable beetle guests.

In this flower the narrow passage is lined with hairs pointing downwards, so that flies and midges easily creep in, while the stiff hairs prevent their egress. The insects are accordingly obliged to make themselves at home. Although they are prisoners, however, they are treated with consideration ; they find shelter, warmth, and food, and their impatient restlessness achieves the end for which the plant attracts them. When the flies become dusted with the pollen grains, the hairs begin to shrink up in the neck of the flower, with the result that the prison is opened and the insects escape.

Should there be other flowers of the same kind blossoming in the neighbourhood, the flies with their dusty coats pass into them and assist in carrying out cross-fertilisation.

ARISTOLOCHIA ORNITHOCEPHALA.

(Side View.)



In *A. elegans* we have a smaller flower with beautifully intricate markings, but although the construction is on the same plan the evil odour is not so repellent as in other species.

A. trifoliata is a climbing plant having flowers that at first sight resemble a pitcher plant; close examination, however, shows that the pitcher-like effect is due to a modification of the upper part of an *Aristolochia* flower, the constricted neck and passage being somewhat small, and the chamber is inflated as in the other flowers.

A large part of the roof of one of our glass-houses is occupied by an *Aristolochia* known by the formidable specific name of *Ornithocephala*, which, however, means nothing worse than "bird's head."

It is a very strong-growing climber, with handsome glaucous leaves, a Brazilian species of a most remarkable character. Its flowers are large, but not so large as those of *A. gigas*; their colour is a creamy brown mottled with intricate markings.

This colour is singular, but the shape is really grotesque. When the blossom is viewed sideways, we see that it does suggest the head and beak of some uncanny fowl. This idea has suggested itself fantastically to the author of the admirable "Dictionary of Gardening," for he describes this



ARISTOLOCHIA ORNITHOCEPHALA.

flower as having "the head of a hawk, and the beak of a heron, with the wattles of a Spanish fowl, which, however, are grey netted with brown ; head of the same colour, veined, and the beak grey."

It may well be termed eccentric, for anything more strange could hardly be imagined.

The drawings will explain the modified form of the three parts of the flower ; the second appendage much resembles a hanging curtain of old chintz somewhat puckered up. The odour from this flower is simply beyond endurance and effectually prevents visitors from remaining in the greenhouse on a hot day when many of the blossoms are expanded and giving out their scent.

Like all the *Aristolochias* this species is pollinated by minute flies, midges or small beetles. The hanging curtain affords a convenient platform from which the insects can alight, and by means of which they can climb up to reach the tiny orifice leading to the cavity rendered so attractive to them by its perfume.

I sometimes send a handful of these floral curiosities with other cut flowers to various bazaar stalls, where they always excite the liveliest interest, but intending purchasers have to be warned of the dreadful odour they will emit when the flowers are once fully matured.

MASDEVALLIA BELLA.

Our list of eccentric flowers would be incomplete without some reference to the Orchid family, a large class of flowers representing eccentricity in the highest degree, since in this group are to be found every variety of form and character, each flower developing some wonderful contrivance for the fertilisation of its blossoms.

Amongst cultivated orchids the *Masdevallias* are remarkable for their quiet colouring and singular form, many of the flowers looking like large spiders and other insects.

I watched with much interest a specimen of *M. bella* which grew in my conservatory last summer. It was rooted in a rustic basket suspended from an archway, and out from the bottom of the basket projected a strange-looking bud, which betokened a truly eccentric



MASDEVALLIA BELLA
BUD.

blossom when it should have attained its full growth.

One morning I was delighted to find that the bud had expanded into a finely-spotted orchid-flower, its surface looking as if it had been made of a lizard's skin. The outer perianth leaves had long tails, and in the centre the pure white lip seemed to be so delicately poised that a breath of air made it tremble and quiver, a feature I had never observed to such a marked degree in any other flower.

The central lip being broad and conspicuous, affords a good platform for small insects to alight upon, and thus they are enabled to get at the nectary, an operation that brings about two results, the insects being rewarded with the food they seek and being made the unconscious means of removing from the stigmatic pouches the little masses of pollen which they disturb when pushing into the cavity of the nectary. Thus it happens that when they withdraw themselves from the nectary with these pollen grains adhering to their bodies and visit other flowers of the same kind, the pollen is brought into contact with the slightly arching stigma, and the first stage of fertilisation is performed.



MASDEVALLIA BELLA.

LADY'S SLIPPER (*Cypripedium*).

There is much to recommend this genus of orchids besides the beauty of their flowers.

They do not require much heat, they have abundant leafage which sets off their curious blossoms, they condescend to grow in pots of earth like ordinary plants, and their flowers last a long time in water after they are gathered.

Most people have a deeply-rooted idea that all orchids require an immense amount of heat, and therefore the possibility of growing them successfully is supposed to be beyond the reach of amateurs who only possess a greenhouse. It is, however, quite possible to flower many interesting species of orchids in an ordinary greenhouse by taking pains to give each plant its proper soil and a suitable position, whether fastened to a piece of bark, planted in a hanging basket, or grown in the usual way in a pot of earth. These and other details are easily learnt from technical books devoted to the growth of orchids.

Cypripedium insigne is an excellent plant to begin with, as it thrives well with ordinary care in a greenhouse.

Cypripedium means Venus' Shoe, but the plant is more often called Lady's Slipper, and the

appropriateness of the name will be seen from the curious form of the flower.

The species of this genus are widely distributed,



CYPRIPEDIUM INSIGNE

for some are found in such cold countries as Siberia and Canada, while others are met with in Mexico, India, and some parts of America.

In order to grasp the significance and wonderful contrivance of the *Cypripedium* flower in its relation to fertilisation, we must carefully note the arrangement of its various parts. The most conspicuous is that known as the *labellum* or slipper, the "waist" or basal part of which is folded over and somewhat constricted, so that the edges nearly meet and form a tunnel, whilst the lower half broadens out into the shape of a slipper.

If we look into the cavity formed by this arrangement, we see that the edges of the slipper are over-arching and the inner surface is highly polished. Now if we can find a small bee and place him in the slipper, we shall discover that it is so shaped that the bee can only escape by going through the narrow tunnel and so out at one of the two openings at the basal end.

In thus going out, the insect cannot fail to detach one of the two pollen masses, and as the pollen is very glutinous, it adheres to the head of the bee, so that when he visits the next flower and presses in to obtain the honey, the pollen is scraped off his head by the sharp edge of the stigma, and the flower is thus cross-pollinated and fertilised, so that healthy and vigorous seed is ensured.

Truly here the eccentricity, if we may so call it, stands revealed to us as a wonderful example of the design of the Creator even in so small a matter as the physiology of a flower.

MY GOURD PERGOLA

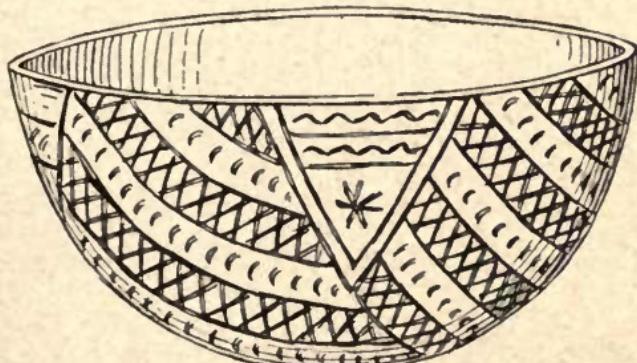
NO doubt we ought to have experienced the parching heat of Eastern countries in order fully to appreciate the importance of such plants as gourds, cucumbers, and melons.

We value them even in our temperate climate as affording a pleasing addition to our table, but in countries where drought and heat continue month after month, the refreshing juice stored up in these fruits and vegetables makes them of essential value in maintaining health and vigour.

In Palestine gourds are cultivated in fields, and a watchman is stationed in a booth to drive away any marauding animals (*Isa. i. 8*).

Dr. Livingstone, in his account of the Kalahari Desert in Africa, speaks of the abundant growth of melons, and the attraction they afford to wild animals. He says: "In years when more than the usual quantity of rain falls, vast

tracts of the country are literally covered with melons (*Cucumis caffer*). Then animals of every sort and name, including man, rejoice in the rich supply. The elephantine lord of the forest revels in this fruit, and so do the different species of rhinoceros, although naturally so diverse in their choice of pasture. The various kinds of antelopes feed on them with equal avidity ; and lions, hyenas,



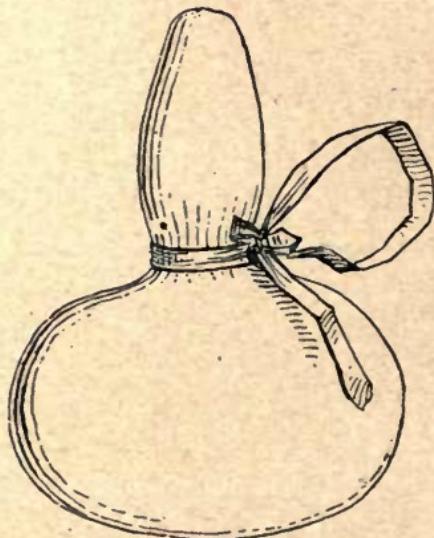
'CARVED GOURD BOWL.

jackals, and mice, all seem to know and appreciate the common blessing.'¹

The wild gourd mentioned in 2 Kings iv. 39 was probably the colocynth (*Citrullus colocynthus*), a plant containing a bitter acrid juice. It yields the colocynth used as medicine. The flavour of this drug would render any food with which it was

" Imperial Dictionary," article " Gourd."

mixed utterly unpalatable. An allied species, the squirting cucumber (*Ecbalium agreste*), which grows wild in Southern Europe, has the singular property of ejecting its seeds, when they are ripe, through an opening at one end of the fruit. "Even when grown in England, this little gourd has been known



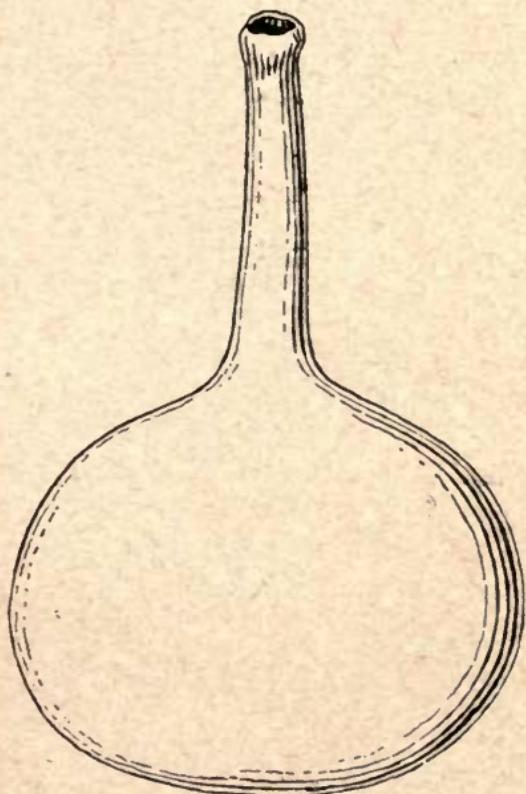
BOTTLE GOURD

to throw its seeds a distance of twenty feet."¹ It is somewhat like a minute hairy cucumber, and is often grown as a curiosity on account of its eccentric method of dispersing its seeds.

In Africa and elsewhere gourds are often beauti-

¹ "Riviera Nature Notes."

fully carved with intricate patterns. I possess several specimens thus ornamented by the natives of Sierra Leone. In one instance the design appears to have been burnt into the rind with a



BOTTLE GOURD (LONG-NECKED).

heated tool, leaving a dark-brown design on a light ground.

Gourds, when dried and cut in halves, form light and convenient bowls for domestic purposes, and

as they are of all sizes, ranging from a small basin up to a capacious bath-tub three or four feet across, we can well understand their usefulness in native huts.

In their young green state gourds can be made

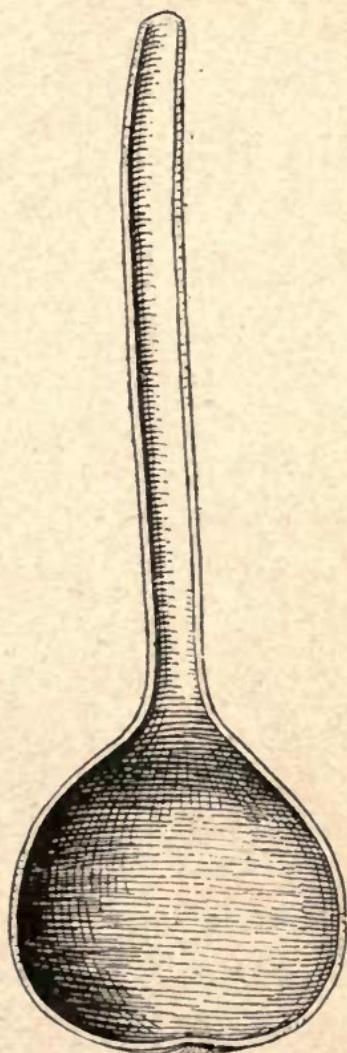


GOULD ON CAMEL SADDLE.

to grow into various shapes by constricting the fruit with ligatures according to the form that may be desired.

Long-necked bottle gourds can be grown from seed as well as being artificially shaped during their growth. One of these in my possession is

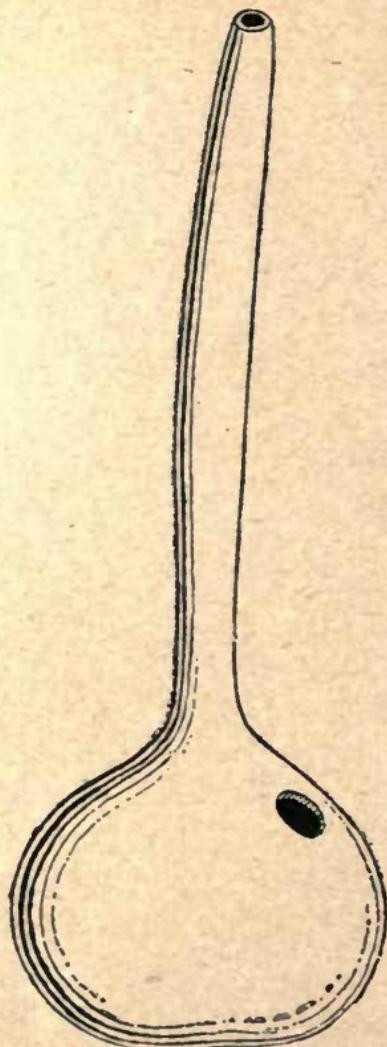
capacious enough to contain a gallon of liquid.



GOURD LADLE.

Such a gourd affords the lightest possible means of carrying a supply of water when travelling.

In Florida and Georgia it is a usual custom to

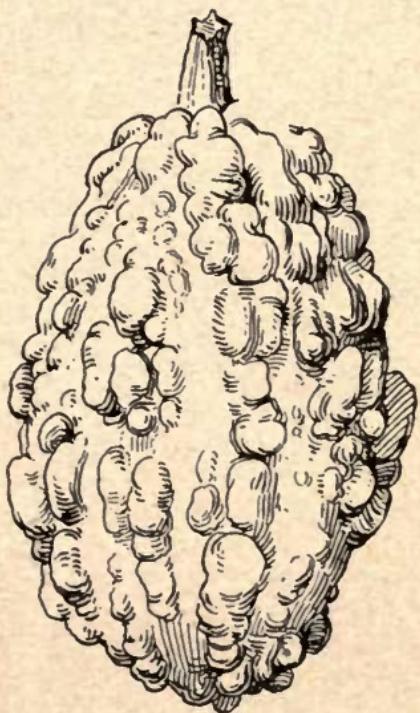


GOURD USED BY BRAHMINS.

have a tub of water at the entrance-door supplied with a ladle formed of a bottle-gourd cut in half,

and the traveller is invited to refresh himself with "a gourd of water."

Brahmins in India use the same shaped gourd, with a long neck, as a kind of horn, producing with



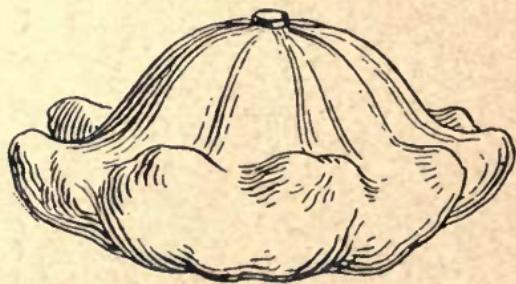
WARTED GOURD.

it a loud unearthly sound in order to summon worshippers to their temples.

We all know the Loofah gourd (*Luffa ægyptiaca*), which, when dried, peeled and cut open, forms an admirable kind of flesh-brush.

This is an annual plant, a native of the tropics; it has a white flower and an angular yellow fruit filled with seeds, mingled with the tenacious fibre which forms its usefulness when it is turned into a washing glove.

For many years I have grown gourds of various kinds, large and small, smooth and warted, some half-yellow and half-green, others beautifully mottled in rich orange and green. When these

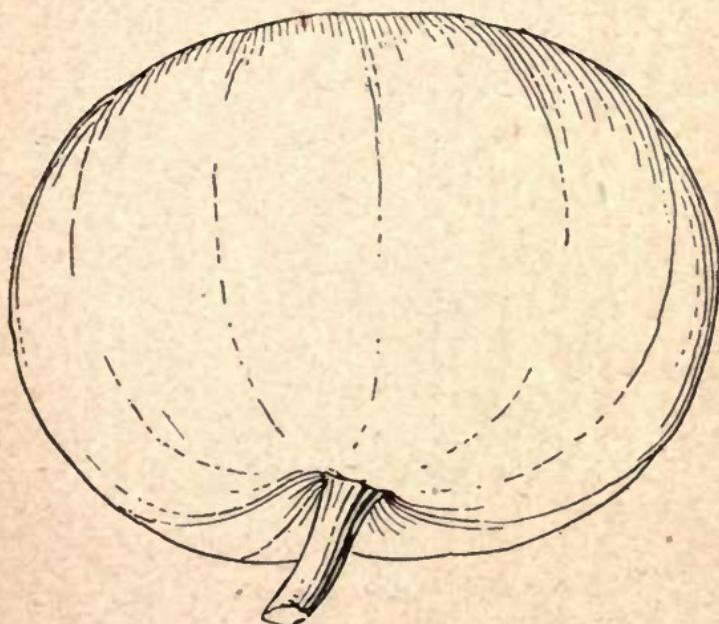


CUSTARD GOURD.

are thoroughly ripened, they form artistic groups in my hall piled upon large china dishes. Such ornamental specimens will last in good condition for twelve months.

The great pumpkins, measuring four or five feet in circumference, are used for soup and pies, which, when made according to a good recipe, are not to be despised as occasional additions to the table.

A quite charming feature in my kitchen garden this summer has been the pergola or trellised enclosure garlanded with gourds. The various coloured fruits hanging amongst the foliage had a very foreign aspect, and it was so much admired

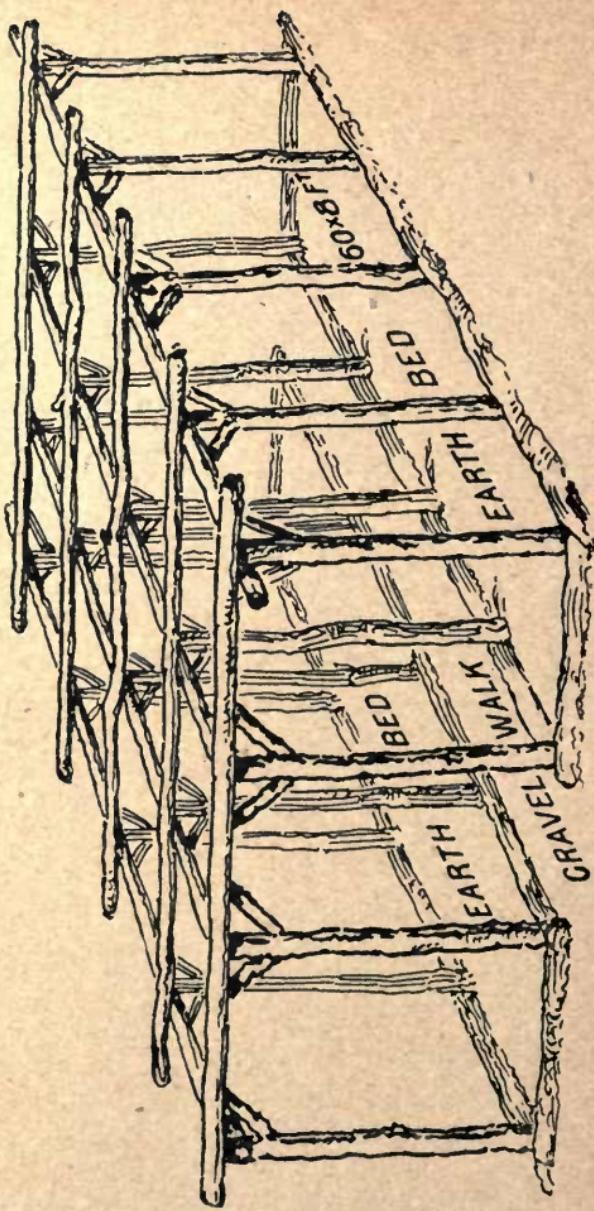


PUMPKIN.

that I believe many would like to know how easily they can attain such an interesting addition to the garden.

A sixpenny packet of mixed gourd seeds¹

¹ These can be obtained from Messrs. Sutton, of Reading, and other seedsmen.



PERGOLA TRELLIS.

GOURD PERGOLA.



should be sown in a hot-bed in March, in pots. Grown on until about the end of May, when frosts are usually over, they can then safely be planted out. The form and size of the pergola or trellis on which the gourds are trained must, of course, vary according to the amount of space which can be allotted to it. My own consists of two beds, each sixty feet long by eight feet broad, divided by a gravel walk. Stout rough-barked poles require to be sunk in the ground at intervals, and then connected with rustic work as suggested in the diagram. The weight of the gourds being considerable, it is necessary to make a firm structure, lest a sudden gale should throw down the erection and so bruise the succulent gourd-stems that they cannot be restored. The soil in the beds should be removed, and a thick layer of rich manure spread over the surface, then the original earth may be replaced, and the young gourds planted at intervals and kept well watered until fully established. In a dry summer daily watering will be essential in order to secure abundant and well-grown fruit.

As the plants throw out their long trailing shoots, sticks should be supplied here and there to guide the stems upward so that the foliage may clothe the trellis in all parts with graceful effect.

The sketch will give some idea of the effect of

the pergola towards the autumn, when the gourds are nearly ripe and the luxuriant leafage makes a deep shade beneath the roof of greenery.

The gourds which are drawn to illustrate this paper are all varieties of *Cucumis pepo*, except the Indian and the Loofah gourd.

I have but mentioned a few out of many varieties of this widely-distributed family of plants. Possibly my readers may be sufficiently interested to pursue the subject further for themselves.

Even growing a few gourd seeds in a pot will afford an excellent object-lesson in botany, for their large size and quick germination make them especially suitable as examples of the early stages of plant growth.

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